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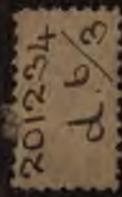
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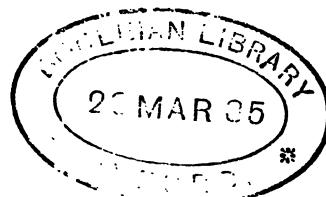


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THE

BLACK SEA PILOT.

THIRD EDITION.



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THE first edition of the Black Sea Pilot (published in 1855) was a translation of the work entitled, Pilote de la Mer Noire et de la Mer d'Azov, by the late Chevalier Taitbout de Marigny, Consul General of the Netherlands at Odessa, published at Constantinople in 1850, to which additions were made from the surveys of Captain Spratt, R.N., C.B., and the officers of H.M. surveying vessel *Spitfire*, as also from the remark books of several of H.M. ships employed in the Black Sea in 1854-5.

A second edition was issued in 1871.

The present edition, revised by Staff Commander C. H. Langdon, includes valuable information relative to the entrance of the Bosphorus and the coasts adjacent, received from W. H. Wrench, Esq., H.M. Consul at Constantinople; and is further amended from Consular reports, and remark books of H.M. ships employed in the Black Sea.

Hydrographic Office, Admiralty, London.
June 1884.

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EXCEPT WHERE MARKED AS TRUE.**

**THE DISTANCES ARE EXPRESSED IN SEA MILES OF
60 TO A DEGREE OF LATITUDE.**

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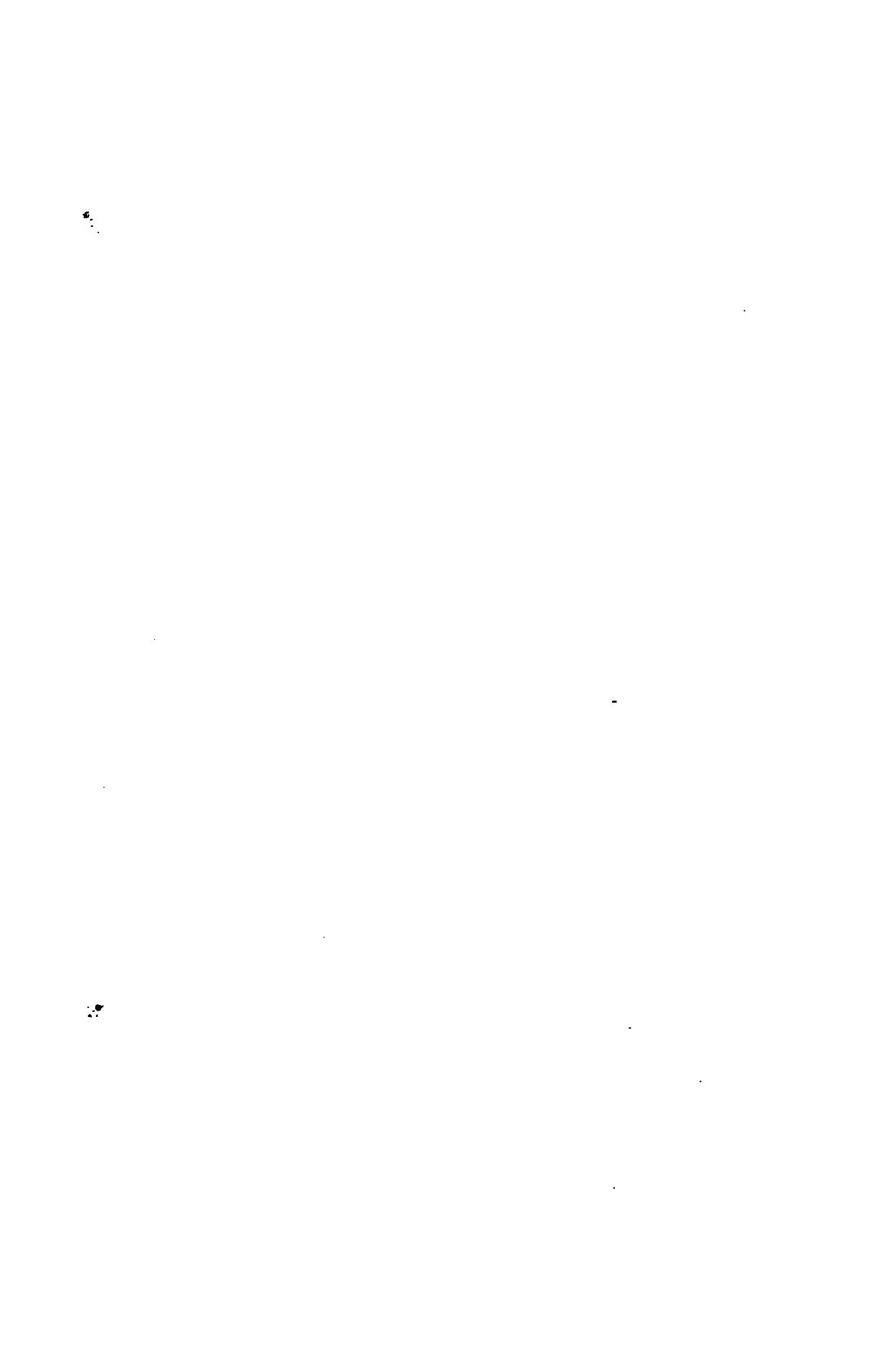
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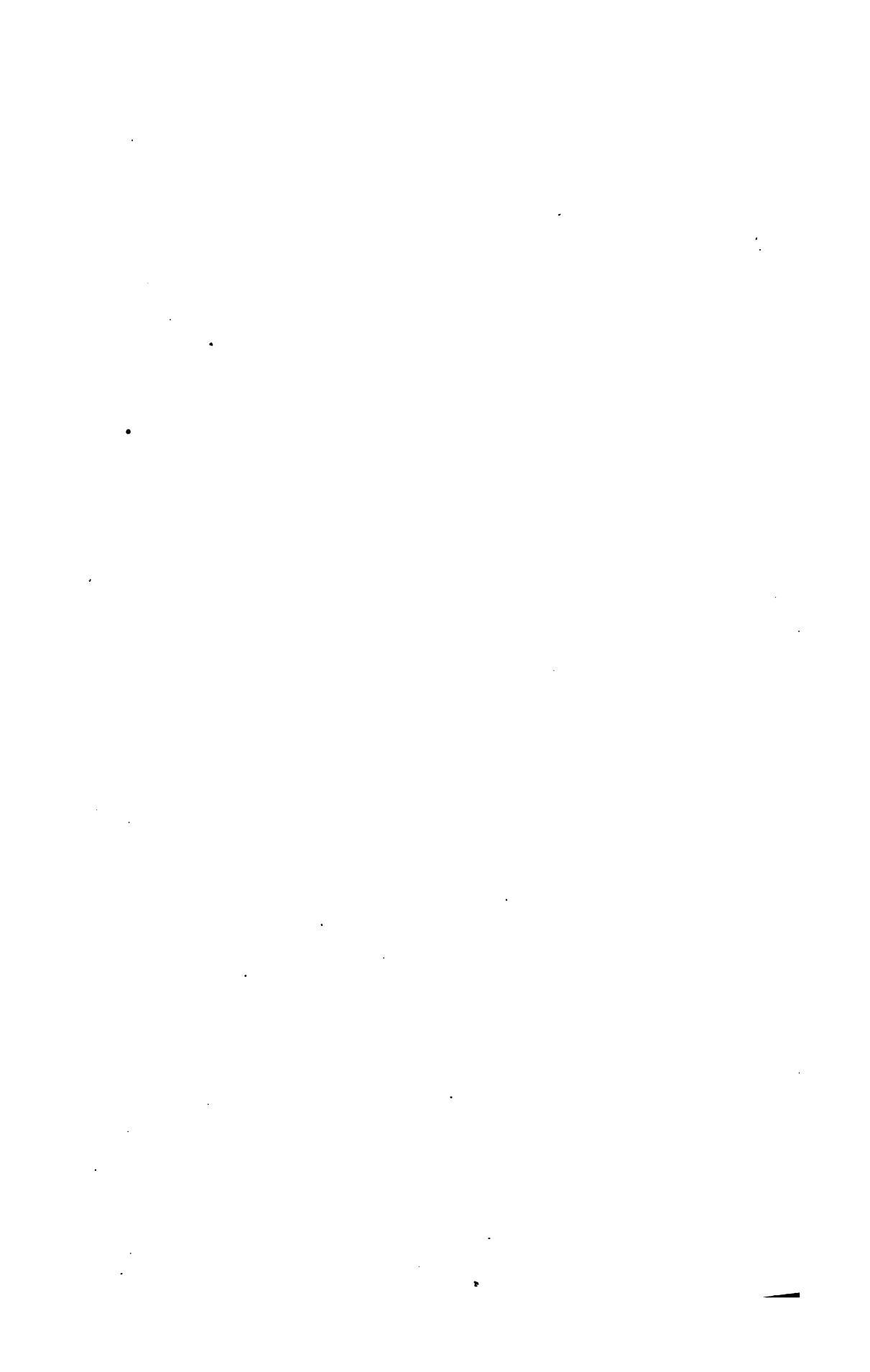
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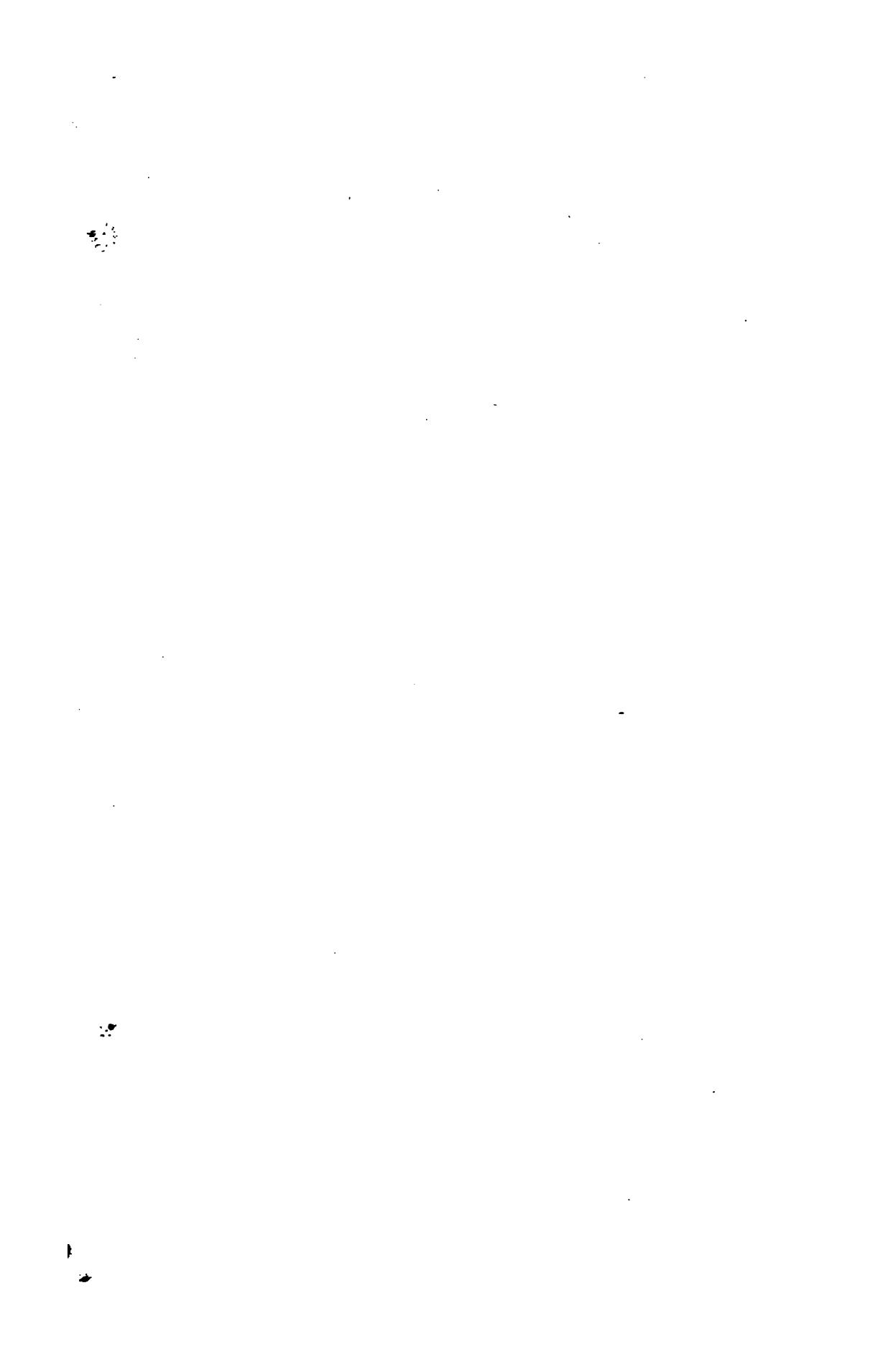
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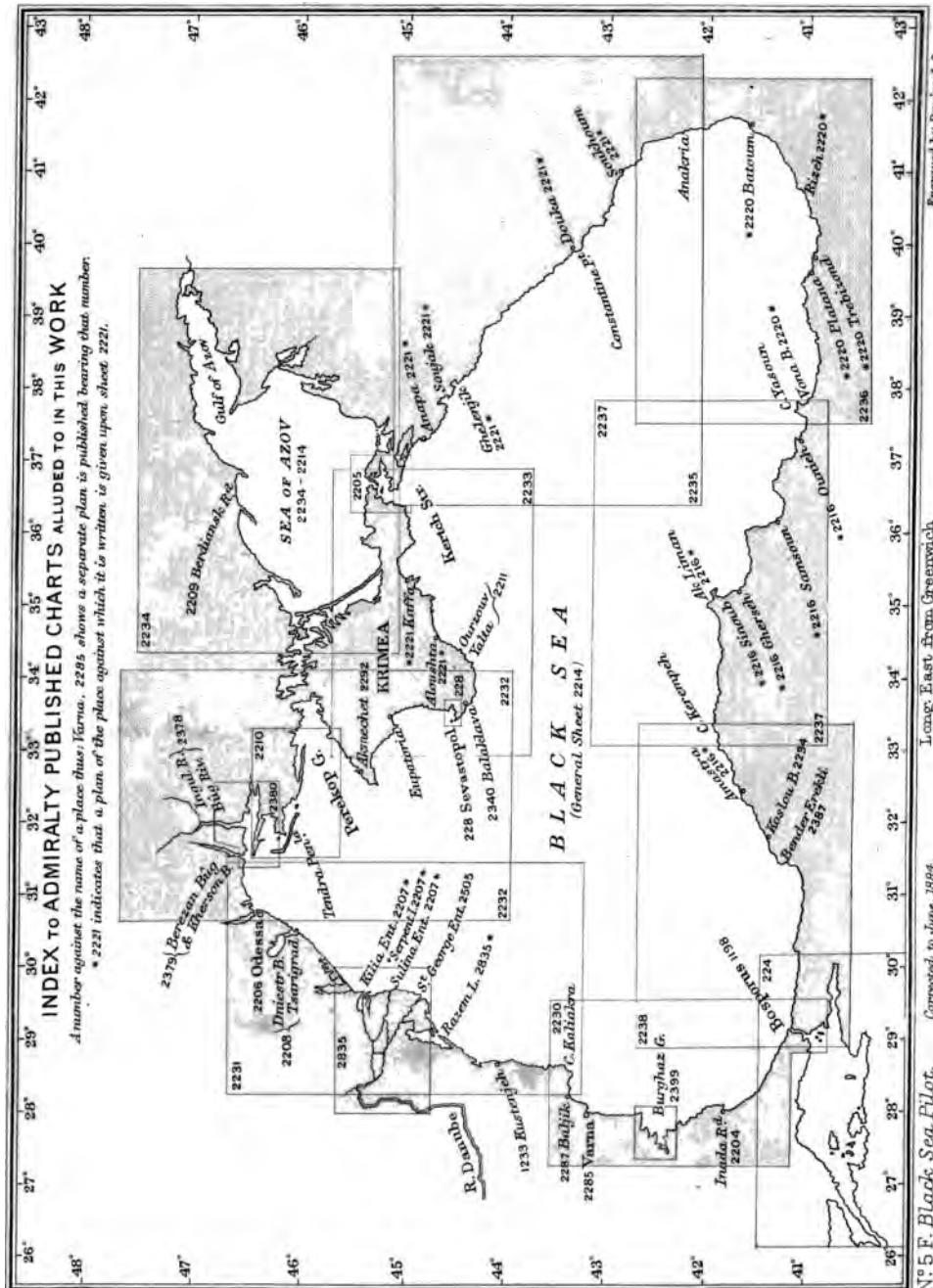
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THE BLACK SEA.

CHAPTER I.

WINDS, CURRENTS, &c.

GENERAL REMARKS.—The Black sea or Kara Deniz of the Turks, Chernoe More of the Russians, Schwarzes Meer of the

For later information respecting the lights which are described in this work, seamen should consult the Admiralty list of lights for the Mediterranean, &c. This light list is published early in the current year, corrected to the preceding 31st December.

meridians of $27^{\circ} 30'$ and $41^{\circ} 46'$ W. Its length, from Burghaz on the west to St. Nikolai on the east, is 627 miles, and its greatest breadth from the Melen Sou to Odessa is 333 miles; but it is much narrowed in the middle by the projecting peninsula of the Crimea, where its breadth does not exceed 144 miles. It is connected with the sea of Azov by the strait of Kertch, and with the Archipelago and the Mediterranean by the Bosporus, the sea of Marmara, and the strait of the Dardanelles. By the first it receives the drainage of a part of southern Russia, and by the second it sends off the surplus waters which are not lost by evaporation. With the exception of the Yellow sea, there is probably no portion of the ocean which receives the drainage of a greater extent of country than the Black sea. As its basin is said to comprehend 960,000 square miles, and its surface to contain only 180,000, it follows that each square mile of its surface receives the drainage of five and one-third square miles, which will account for the small degree of saltiness of its waters. Their specific gravity, compared with that of fresh water, is as 1142 to 1000; that of the Baltic is 1040, while that of the water of the Atlantic is 1288.

Aspect.—The shores of the Black sea present a varied aspect; those of the Krimea, of Anatolia, and Circassia, bordered by lofty mountains, are easily recognized, as well as Bulgaria and Roumelia, where capes Kaliakra, Emineh, and the Balkan mountains are good landmarks, but at the mouths of the Danube and all the coast between them and the northern part of the Krimea the shore is low, and can only be seen at a short distance. The most important coast to be noticed from the number of vessels which frequent it, and as requiring the greatest caution, is that in the vicinity of the Bosphorus.

The navigation of the Black sea is neither difficult nor dangerous, as it is almost entirely free from islands and rocks. Good anchorages are scarce, but there are enough to afford shelter in a sea of such small extent, so that a thorough acquaintance with them is of importance. Storms are not uncommon, but they are never of long duration. The sea then, however, is short and troublesome, more especially about the entrance of the Bosphorus.

CURRENTS.—By far the greatest quantity of water is received into this sea at its north-western corner, where the rivers Dniepr, Búg, Dniestr, and Danube fall into it. Most of the countries through which these rivers run are covered for three or four months of the year with snow; and in spring time all the moisture which has descended on them during the winter, and has been preserved in a solid state, suddenly dissolves and descends through the channels of the rivers with great velocity, producing a current running to the southward.

The strong current which sets out of the strait of Kertch owes its origin to the river Don, and to the many rivers which flow into the sea of Azov. As it enters the Black sea it takes a south-westerly direction, along the coast of the Krimea. Westward of cape Khersonese it spreads out in different directions; that to the northward, towards Eupatoria and cape Tarkhan, bends to the westward, and meets the waters of the Dniepr, the Búg, and the Dniestr, which turn it away to the southward, and these uniting with the water which flows out of the Danube form a current of about one mile an hour towards the Bosphorus. The accumulation of the waters towards this strait, especially with strong northerly winds, is so great that it is not able to carry off all of it, and a portion is pressed against the coast of Anatolia, where it gives rise to another current running to the eastward, and which makes its way along the coast of Asia, and mingles with the waters of the Sakárieh, the Kizil, the Yeshil, and the Chorúk (Tschorock), which carry it on to the eastward between Anatolia and the Caucasus, where it meets with the Rion, the Kodor, and other rivers which add considerably to its strength. It then follows in a north-

westerly direction the Caucasian shore, receiving all the waters from the mountains and the river Kuban, as far as the strait of Kertch, where it completes, but only to commence anew, that circular movement which has been described.

The different directions which have been thus ascribed to the Black sea currents must not be taken as absolute on all occasions, as they are sometimes influenced by the winds or by local circumstances. There are counter currents or eddies in the bays on the coasts of Roumelia and Bulgaria, and also at a little distance from the shores of Anatolia.

For instance, in December 1852, 13 vessels bound from Odessa to Varna were wrecked near cape Shabler, and in March 1855 six more, between that cape and Mangalí, when bound to Varna from the Krimea. As this loss may have been caused by an unusually strong current to the west or even north-west, the mariner should be on his guard against such an occurrence.

Also, Commander W. H. Hall, H.M.S. *Flamingo*, 1877, remarks, on his passage from Burghaz to Constantinople, that with a moderate gale from N.E., an unmistakeable set on to the coast and to the southward was experienced, amounting at first to only half a knot an hour, but getting stronger as the wind increased, and was such as might have caused the loss of many vessels had the coast lights not been seen. On the passage to Burghaz from Constantinople, with calms and light southerly winds, no current was experienced, which appears to point to the fact that the currents are greatly influenced by the prevailing wind. Navigating Lieutenant W. Bullmore, H.M.S. *Rapid*, 1877, whilst corroborating the above remarks, states that if S.E. and southerly winds have been blowing for three or four days, a set of about half a mile an hour will be observed in a contrary direction.

If a vessel is becalmed on the southern coast of the Krimea, between Ourzouf and cape Khersonese, or on the coast of Circassia, towards Pitsounda and Konstantine points, she will be sensibly affected by the current. When endeavouring to turn to windward she should make long boards out into the open sea, and never come in close to the coast, as the mountainous ridges of the Krimea will not favour her with any land breezes at night, and those that are found on the Caucasian coast, although pretty fresh in some places, do not reach more than 4 or 5 miles from the shore.

Vessels bound from the Bosporus to Kaffa or Kertch, and meeting with easterly winds, should, in order to avoid the adverse current on the southern coast of the Krimea, turn to windward nearer the coast of Anatolia than that of the Krimea, as far as cape Injeh.

WINDS.—By comparing many meteorologic observations results might be furnished, useful to the seaman, relating to the influence that different parts of the Black sea exercise over the winds that blow there. Those of several navigators, made without any definite object, establish a line of demarcation from cape Aiá in the Krimea, to cape Kerempeh in Anatolia, thus dividing this sea into two parts, the western and the eastern. It is rare to pass this line without observing the change, and vessels that come up to it with a fair wind are often obliged suddenly to brace their yards sharp up. There is a second division, established by the direction of the winds, which divides the northern from the southern part of the Black sea. This line, more vaguely marked, varies in the western basin from cape Kaliakra to the mouths of the Danube, and in the eastern basin on the Caucasian coast, from Soubeshik to cape Idokopas, near Pshad. It will be obvious that these two lines of demarcation are much less observable in the open sea than they are near the shores.

The coast of Asia Minor is rarely exposed to the violence of northerly winds; when they do occur they seldom blow home, being deflected towards east or west by the lofty range of mountains which extend in that direction throughout the country. The same thing has been observed on the coast of Caucasus with West or S.W. winds, and on the southern coast of the Krimea with South or S.E. winds; but there are exceptions to these general rules, and they are the more remarkable, as they are invariably violent, which was proved in 1835 by the awful tempest, which occasioned the loss of several Russian ships of war and transports, on the coast of Circassia, and the more recent gale of the 14th November 1854, when several English transports were wrecked in Balaklava and Eupatoria bays.

A north-easterly wind brings with it clear weather and cold in winter. North-westerly and westerly winds, on the contrary, are often accompanied by fog and moist weather. Towards the middle of summer the northerly wind is generally pretty steady, and although at a later period it gives place to a southerly wind, yet it often reappears in January, and sometimes in February and March, and during all the spring. These remarks relate principally to the western portion of the Black sea, which is subject to the influence of the Carpathian mountains, and the chain of the Balkan. In the eastern portion, the influence of the lofty range of the Caucasus and of Asia Minor is felt, and it is a remarkable fact, that the prevalent winds in winter on this coast from Anápa to Soubeshik, are these from the N.W., and from Soubeshik to Mingrelia, from the S.E., although Soubeshik forms no very prominent point on the coast. The N.E. wind, by the violence with which it blows from the tops of

the mountains, is said to come from "The Bed of Boreas," a term given by the ancient Greeks, and which applies at the present day. The winds from the Anatolian shore are also, in many parts, the strongest that blow there.

Northerly winds formerly often obliged sailing vessels coming from the Mediterranean into the Black sea to pass weeks in the Dardanelles and in the Bosphorus; the juxtaposition of the shores of Europe and Asia, and the rapidity of the current rendering it difficult to turn to windward, an inconvenience which often caused considerable injury to commercial interests in the Black sea, but which, since the use of steam tugs, does so no longer.* If, after leaving the Bosphorus and bound to Odessa, northerly winds are met with in the open sea, it would be prudent, instead of beating along the coast of Roumelia or Bulgaria, to close the Krimean shore and take advantage of the N.E. or E.N.E. winds which prevail there, independently of the land breezes which Sevastópol, and more particularly Eupatoria, afford almost every night.†

WINTERS.—The winters are severe in the Black sea, but more particularly on its northern shores. The month of December and the second half of January are often called the least dangerous of the season. The mouths of the Dniepr, the Dniestr, and sometimes those of the Danube, the port of Odessa, and the strait of Kertch, where the water is all but fresh, are frozen every winter more or less. The ice seldom extends far to seaward, and often a southerly wind springs up and clears it all away with wonderful rapidity. It is rare, indeed, that the cold has been severe enough to leave traces of ice after the end of February. The time of its formation at Odessa is towards the end of December, and in the space of twenty years there were only three or four consecutive years in which this port was completely free of ice.

LIGHTS.—BUOYS.—It is the custom in November to remove the light vessels and buoys in Kherson bay, Kertch strait, and the sea of Azov, their positions being marked by perches or beacons of the same colour. When navigation is resumed in the spring (about April) the light vessels and buoys are again laid out.

* See Sailing Directions for the Dardanelles, &c., 1882, pp. 30-37, and 119-129.

† See also Directions for Return voyage, pp. 133—137.

CHAPTER II.

WESTERN SHORE ; FROM THE BOSPORUS TO ODESSA.

VARIATION in 1884.

Bosporus - - - $4^{\circ} 45' W.$ | Kustenjeh - - - $4^{\circ} 30' W.$

The Coast at the north-east entrance of the Bosphorus is of moderate height, but the landmarks on it, which serve to guide the navigator, are often enveloped in thick fogs, which are the more dangerous in these parts, so wanting in places of refuge, that one mistake may cause inevitable shipwreck. The entrance is nearly 2 miles in breadth, and is marked by a lighthouse on the coast of Europe, and another on that of Asia. From cape Roumili westward, as far as Kilios, the coast presents a very broken outline, small coves appearing here and there, each with its little strip of white beach, bounded on either side by jutting rocky points. The shore is fringed with cliffs and may be approached to half a mile, 8 fathoms being obtained close in to the rocks.*

The coast beyond Kara-burnu, which is 21 miles to the north-westward of cape Roumili, bears a resemblance to the land in the vicinity of the Bosphorus, which circumstance has given it the name of the false entrance, and the mistaking this for the true Bosphorus has caused the loss of many vessels.

LIFEBOAT and ROCKET SERVICE.—This service, established at the Black sea entrance to the Bosphorus, extends from Cheshmédjik beyond Dercos in Europe, to Shilli (Kilia) in Asia. On each side a crew of about 70 men, distributed among the various stations, is under the command of an Englishman. There are four lifeboats, stationed at Kilios and Kara-burnu in Europe, and at Riva and Shilli in Asia ; there are also 15 rocket stations, hereinafter mentioned.†

The light vessel, also commanded by an Englishman, the fog guns, beacons, and whitewashed cliffs, all form part of this service.

* See Admiralty charts. Black sea, No. 2,214, with view ; Bosphorus to cape Kaliakra, No. 2,230 ; Bosphorus to Kerempeh, No. 2,238 ; Sea of Marmara, No. 224 ; and Bosphorus, No. 1,198.

† Information relating to the lifeboat and rocket service, as well as to the coasts in the vicinity of the Bosphorus, received from W. H. Wrench, Esq., H.M. Consul at Constantinople, 1883.

By day and by night, the whole coast from Cheshmédjik to Shilli is watched by look-out men, and by patrol parties during a gale of wind or in thick snow or foggy weather. Shipmasters in position of danger or difficulty, will, on all occasions, receive gratuitously, advice or assistance from the officers and men of this service, who may easily be recognized by their uniform, which bears a distinctive badge on the coat sleeve.

Fog guns have been established at the entrance to the Bosphorus and are fired during thick and foggy weather, by day or night, as follows:—The gun on the European side is fired *once every twenty minutes*, and after an interval of *five minutes* is answered by the guns on the Asiatic side, which fires *twice* in rapid succession. The European gun is placed (1883) on the walls of the castle of Roumili Kalessi, and the Asiatic guns near beacon No. 1, on Youm-burnu.

Beacons and Landmarks.—To assist in identifying the Bosphorus, eight beacons have been placed along the coast at each side of the entrance. Those on the European coast are cone-topped and painted red and white in horizontal bands; those on the Asiatic side are red, surmounted by a ball. The cliffs in certain places on the Asiatic side are whitened, and thus afford an easily distinguishable mark to vessels approaching it. On the European side, between Kilios and Kisir Kaia, the red sands of Doumousdéré are visible from a long distance to seaward in clear weather.

The stations of the lifeboat and rocket service on the European shore are painted red, with a broad white horizontal band, while those on the Asiatic side are painted white.

On the **European side**, the beacons, painted in red and white horizontal bands, are consecutively as follows:—

Beacon.	Height. Feet.	Position.
	I. 50	Ouzounieh point, 2 miles westward of Roumili lighthouse. Rocket station at Aklama, about one mile to the eastward.
	II. 50	Kilios, 3½ miles westward of Roumili lighthouse. Lifeboat and rocket station.
	III. 48	Kisir Kaia, 6 miles westward of Roumili lighthouse. Rocket station to the westward.
	IV. 40	Agali (Agatchili), 10½ miles westward of Roumili lighthouse. Rocket station.

Beacon.	Height. Feet.	Position.
	V. 40	Ak Bunar, 14 miles westward of Roumili lighthouse. Rocket station.
	VI. 45	Kunduzdéré, 17 miles westward of Roumili lighthouse. Rocket station.
	VII. 45	Derkos, 23½ miles westward of Roumili lighthouse, and 3 miles west of Kara-burnu lighthouse. Lifeboat and rocket station.
	VIII. 45	Cheshmedjik, 26½ miles westward of Roumili lighthouse and 5½ miles west of Kara-burnu lighthouse. Rocket station to the eastward.

And on the **Asiatic side**, painted red, they are consecutively as follows:—

	I. 80	Youn-burnu, ¾ mile north-eastward of Anatoli light- house. Fog gun, rocket station, and whitewashed cliff.
	II. 30	Ahalhulta, 1½ miles eastward of Anatoli lighthouse.
	III. 50	Khair-sis islet, 3 miles eastward of Anatoli lighthouse. Lifeboat and rocket station at Riva, close to the westward of the islet.
	IV. 40	Galara-burnu, 4½ miles eastward of Anatoli lighthouse. Rocket station and whitewashed cliff.
	V. 50	Adarjicklar, 6½ miles eastward of Anatoli lighthouse. Rocket station.
	VI. 41	Kara-burnu, 10 miles eastward of Anatoli lighthouse. Rocket station and whitewashed cliff.
	VII. 40	Alladjilli, 13 miles eastward of Anatoli lighthouse. Rocket station, between beacons VII. and VIII.
	VIII. 40	Maxa or Marah-burnu, 17 miles eastward of Anatoli lighthouse, and 5 miles west of Kilia lighthouse. Whitewashed tower, lifeboat and rocket station, in the bay just westward of Kilia (Shilli) lighthouse.

CAPE ROUMILI on the European shore of the Bosphorus, on which stands the lighthouse and the Greek village of Roumili Phener, is surrounded by a belt of high rocks with steep faces, on one of which, named Kyani island, is still seen the remains of an altar dedicated to Cæsar Augustus. At the distance of one cable eastward of the island, there is a depth of only $3\frac{3}{4}$ fathoms. A vessel may anchor during S.W. winds in fine weather, or in a calm, at 4 or 5 cables S.E. of the island, in 15 fathoms, over mud bottom.

LIGHTS.—Roumili lighthouse, on the European shore, stands on a rocky promontory, a third of a mile to the southward of an ancient castle named Roumili Kalessi. The tower, 99 feet in height, which is formed of different diameters, carries a fixed white light, 190 feet above the sea, which should be visible 18 miles, but being badly managed is seldom seen at that distance. Northward of the tower a group of high trees serves as a day mark for vessels making the strait. For fog signals *see* page 7.

Anatoli lighthouse, a white stone tower 65 feet in height, stands on the ancient promontory Hereum, at the north extremity of the Bosphorus on the Asiatic shore, about 2 miles S.E. $\frac{3}{4}$ E. of Roumili lighthouse. It exhibits at an elevation of 249 feet above the sea, a revolving light showing alternately a *red* face followed by two *white* faces or flashes, at intervals of *two* minutes, the light gradually increasing and decreasing, but never totally eclipsed; in clear weather it should be visible from a distance of 20 miles, but is seldom seen at that distance. This lighthouse being built on elevated ground, may be recognized during the day, by the tower being only of a single diameter, with a wall running down from it, and likewise by a large white building on a high hill to the south-eastward. The fort of Anatoli lies at the foot of the tower.

LIGHT VESSEL.—A light vessel is moored in 55 fathoms 15 miles N.N.E. $\frac{1}{2}$ E. of the entrance to the Bosphorus which exhibits two *fixed* white lights, on separate masts, 28 feet high, and visible in clear weather from a distance of 9 miles.

Ouzounieh Burnu, on which is beacon No. 1, is the most projecting of the rocky points, between Roumili and Kilius. This point forms the eastern side of the largest of several coves, open only to the northward, in which 3 fathoms are obtained at one cable from the shore. This is the most inviting spot in the vicinity, in the event of having to run a disabled ship on shore as a last resource for saving life.

KILIUS POINT (Eski Fanarakı Burnu) is situated about $3\frac{1}{2}$ miles westward of Roumili lighthouse, and slopes gradually from a hill behind, terminating abruptly in a cliff, and leaving a gap of a few yards

wide between it and a large rock, that at one time was evidently a portion of it.

Beacon.—On the rising ground of the point is beacon No. II.

Village.—The cliffs of the point continue for some little distance to the westward, meeting the sandy beach, which stretches eastward from Kisir Kaia. On these cliffs stand an ancient castle, and barracks for a small garrison. The Turkish village of Kilios is built on the slope behind the castle, so that but little of it is seen from the sea. This locality is well marked by three pillars of an ancient aqueduct standing in the hollow of the little bay to the westward, and which appear like the tall chimneys of a factory.

A lifeboat and rocket station is established here, from which telegraphic or telephonic messages can be sent to Constantinople.

Telegraph Cable.—The Odessa telegraph cable enters the sea at Kilios bay, passing 3 or 4 cables westward of Kala-photia rock, then taking a north-west direction.

Kala-photia Rock.—In a N.N.W. direction from Kilios point, about 3 to 4 cables distance, is a rock awash and steep-to, named Kala-photia, after a Greek vessel that was lost there; the sea breaks in bad weather in the channel between it and Kilios point, in which there is a depth of 5 fathoms. A patch of $2\frac{1}{2}$ fathoms lies half a cable northward of Kilios point.

Anchorage.—The anchorage abreast the village of Kilios is in 3 or 4 fathoms, over a bottom of hard sand, at 2 or 3 cables from the shore, sheltered from southerly and easterly winds.

Navigating Lieutenant H. Swire, H.M.S. *Flamingo*, 1878 (corroborated by Captain Palmer in charge of the lifeboat station), observes:—In Kilios bay with a northerly wind the sea immediately rises, and the whole bay is filled with breakers. The swell generally sets in before the wind, and vessels at anchor should stand out on the first indication of an approaching norther. There is a remarkable indication in Kilios bay of the force with which the wind and sea beat in on the shore from the Black sea, for the whole hight of the bay, about one mile in extent, is covered with sand, which has evidently been flung up by the waves, and carried by the wind over the low hills on the coast, which themselves were probably formed in this manner. These form such a marked contrast of colour to the other parts of the coast, that they may be seen at a considerable distance, and are the best marks for recognizing the locality.

The Coast.—**Bank.**—Westward of Kilios a long sandy beach commences, which, broken only at Kisir Kaia and Kara-burnu, is quite straight,

trending N.W. by W. for 37 miles; it is faced by a sand-bank, with a depth only of 5 feet, at 2 cables from the shore, upon which, vessels disabled and desirous to beach, are stranded and lost, if not carried over by the waves.

Doumousdéré.—The red sands of this valley, which is situated midway between Kilios and Kisir Kaia, form a good landmark for vessels making the entrance to the Bosphorus.

Kisir Kaia is a rocky point projecting slightly into the sea, the ground rising gradually behind it. On the top of the rising ground is beacon No. III. A small body of soldiers is stationed here, and a few houses stand on the western slope, hidden from the eastward. West of this point the beach again commences, and continues as far as Kara-burnu.

Mandra Déré.—On rising ground, one-quarter of a mile westward of Kisir Kaia, is the rocket station of Mandra-déré.

Agatchili.—Beacon No. IV., with a rocket station, is established at Agatchili. There is no village here, but a government farm is situated about 2 miles inland.

Ak-Bunar and Kunduz.—Beacon No. V. is at Ak-Bunar, and beacon No. VI. at Kunduz; a rocket station is established at both these places, but there is no village.

KARA-BURNU, situated 21 miles to the north-westward of cape Roumili, is a bold headland stretching a considerable distance into the sea, forming a small bay on either side. It has a nearly perpendicular face, and is steep-to, 20 fathoms being obtained at about one cable from the shore.

Lifeboat.—In the bay to the eastward is the lifeboat house; and on the top of the headland a rocket station.

LIGHT.—The lighthouse, 27 feet high, painted red and white in horizontal bands to correspond with the beacons, stands on the edge of the cliff; it exhibits at 302 feet above high water, a *flashing* white light every *ten seconds*; but the eclipses within a distance of 2 miles do not appear total: it should in clear weather be visible 27 miles.

On the summit of the headland and on the eastern slope, stands the small village of Kara-burnu, which in the course of the present year (1883) will be connected with Constantinople by telegraph. A few artillerymen are stationed here in charge of two ruined batteries, situated on the cliffs to the north-east, in which a few old brass guns are mounted. From here, there is a fair road all the way to Stamboul, which meets the telegraph wires at the small Greek village of Derkos (situated near the south-east

end of the lake), and then runs along by their side the remainder of the distance.

Lake Derkos (False entrance), the locality of which has so frequently been mistaken for the entrance of the Bosphorus, is bounded to the southward by an irregular range of hills, which, bearing some resemblance to the winding, self-closing banks of the Bosphorus, add greatly to its deceptive appearance in thick weather. This circumstance has given it the name of the False entrance; the mistaking of which for the true Bosphorus has been the cause of many shipwrecks; but as the coast is now lighted and beaconed, these mistakes are not likely to occur. Here is the outlet of the lake, the mouth of which is frequently closed during the summer months. Two ferries exist for the passage of this outlet, the one belonging to the lifeboat and rocket service being near the shore; and the other, at the distance of three-quarters of a mile inland.

Cheshmedjik is at the commencement of the hills running along the shore to the north-westward, which show a yellowish face seaward.

Beacons and rocket stations.—At Cheshmedjik is situated beacon No. VII., and to the westward in a small valley is the last rocket station on the European coast. On the rising ground about 2 miles to the westward is beacon No. VIII., the last of the series, near which is an old refuge house, now used as a store for rocket gear.

Ormanli.—The country in the immediate vicinity shows no signs of cultivation, being covered with brushwood, arbutus, and scrub oak trees; the nearest village, Orman, is several miles inland, and has no communication with the sea. It is so named from its situation in a well wooded country (Orman meaning woods), and is of some importance, being the chief village of a large district and a telegraph station.

Serveh-burnu lies 32 miles north-westward of Kara-burnu and 52 from the Bosphorus. It projects considerably to the eastward, and would afford shelter from northerly winds, if the bottom were not bad and rocky. A reef extends $1\frac{1}{2}$ cables S.E. from the cape.

Midiah.—At 2 miles to the southward of Serveh-burnu is the small town of Midiah. A little creek is formed on its southern side, about 100 yards in breadth, which will only serve as a shelter against the northerly winds to small vessels that can anchor in from $1\frac{1}{2}$ to 2 fathoms over a sandy bottom.

Cape Kuri.—Nearly 13 miles to the northward of Serveh-burnu is cape Kuri, which is of moderate height, projecting to the southward. Its shores are sloping, and of a yellowish appearance, and a little wood on its summit, as well as the lighthouse, serves to distinguish it.

LIGHT.—A *fixed* white light, varied by a *flash* every *two minutes*, is exhibited from a white tower on cape Kuri, at an elevation of 174 feet above the sea, and is visible 15 miles.

INADA (YNIADA) ROAD.—Inada point, the western angle of the promontory, of which cape Kuri forms a part, is bordered with rocks, and between it and the village and fort of that name, which lies $2\frac{1}{4}$ miles to the westward, is Inada road. A reef of rocks extends off in a south-westerly direction, 2 cables from a ruined tower, on the northern shore of the road, which stands nearly three-quarters of a mile north-westward of Inada point.*

Anchorage.—A vessel, in approaching the road with a northerly wind, should round the cape and Inada point pretty close, as the wind will fail inside, taking care to avoid the rocks off the cape and the ruined tower. The best anchorage is west-south-westward of the tower, about three-quarters of a mile from the shore, in from 6 to 7 fathoms, over a bottom of sand and fair holding ground, Inada point bearing E. $\frac{3}{4}$ S. $1\frac{1}{2}$ miles. There are 3 to 4 fathoms about 3 cables from the shore. Vessels very often visit this roadstead, particularly in autumn and winter, to allow the bad weather to pass; and although it has afforded security to many, yet the sudden changes of wind to which it is subject, have been, though very seldom, the cause of shipwrecks. Here, as all along the coast, the winds veer towards the shore every night. A heavy swell sets in at times, which causes vessels to roll very heavily, and then an eddy sets strongly towards the cape. At the bottom of the road there is a beach. Cape Stephanos lies 4 miles to the northward of cape Kuri, and projects very little to the eastward.

Agathópoli.—At 11 miles to the northward of cape Stephanos is the little town of Agathópoli, called by the Turks Ak-téboli, from which mount Paphia, one of the most remarkable mountains on the coast of Roumelia, bears W. by N. 4 miles. A small cove lies to the southward of the town, formed by two points, on the northernmost of which stands the town, about 52 feet above the water. The point to the southward is about half that height. The entrance to the cove, a little more than half a cable wide, is between a reef of rocks which borders the northern point, and the southern point, which is bold to approach. Most of the rocks are visible, and appear as large as buoys above the water, the greatest depth in the channel being about $4\frac{3}{4}$ fathoms.

Anchorage.—On entering the cove, a solitary building, which is a

* See Admiralty plan of Inada road, No. 2,204; scale, $m = 1\cdot5$ inches.

church dedicated to Saint Constantine, is seen a little to the southward of the southern point. The anchorage is, in about 4 fathoms, over a sandy bottom, sheltered from all but easterly winds, which can be avoided by approaching nearer the town, and securing the vessel's stern to the shore, which is composed of shingle.

Basiliko (Vasiliko) Harbour.—The little harbour of Basiliko lies about 5 miles N.W. by N. of Agathópoli, and about 2 miles eastward of a mountain to the northward of mount Paphia. It is formed by two points, about N. by W. and S. by E. from each other, a third of a mile apart. On the southern point stands the village and mills, and to the eastward of it, about a third of a mile from the shore, are several rocks rising a few feet above the water.

Anchorage.—The entrance to the harbour is about 3 cables wide, and is formed between a reef which runs off the northern point, and the point to the southward, on which stands the village. A vessel will find 6 fathoms at the entrance, and should keep the point of the village aboard, and anchor to the westward of it at about half a cable from the shore, in from 3 to 4 fathoms, over a good holding ground of sand, sheltered nearly from all winds. In the other parts of the harbour the holding ground is not good, being composed of sand and flat stones, over which the anchors are liable to drag.

Kara-agatche.—The anchorage at Kara-agatche is in a small cove 5 miles north-west of Basiliko, and the entrance to it is southward of a long and wide reef, which extends off for two-thirds of a mile in a south-easterly direction from the northern point of the cove, and another point to the south south-eastward, having a depth of from 12 to 4 fathoms between them. The approach to this roadstead, which is, however, but little frequented, is from the southward, and a vessel should keep the western shore on board before standing for the anchorage, which is in the northern part of the cove, in about 4 fathoms, abreast of a river, and well sheltered.

At 1½ miles to the northward of Kara-agatche is a small bay, about a mile in depth, open to the eastward. It is formed by two points N. $\frac{3}{4}$ W. and S. $\frac{3}{4}$ E. from each other, 1½ miles apart, and carries a depth of from 4 to 8 fathoms over a sandy bottom. Athánatos, the southern point, has a reef extending from it for more than 1½ cables to the northward, with a few of the rocks above water ; Zunaritsa, the northern point, has a similar reef running out about the same distance south-south-eastward.

Anchorages.—A vessel wishing to anchor in the southern part of this bay should, on opening out the little bight formed between the cliffs to the westward of Athánatos point, steer for it when it bears due South.

There is room here for five or six vessels in about 4 fathoms, if they secure their sterns to the shore. A creek, about 130 feet wide, forms part of this bight, the entrance into which is only large enough to admit a small vessel; but there is space enough inside for three or four vessels drawing 16 feet water.

There is anchorage in the northern part of the bay, in about 4 fathoms, with the vessel's stern secured to the shore, between the reef which extends off Zunaritsa point and the beach which borders the northern shore. The sea sometimes sets in when it is blowing fresh from the S.E., but the wind does not blow home. Care must be taken in approaching this anchorage to avoid a long flat shelf of sunken rocks which runs off to the southward, from the second prominence to the westward of Zunaritsa point. A vessel, therefore, after passing to the southward of the reef off Zunaritsa point, should continue on to the westward, and only haul up when the end of the beach bears N.W. There is a rivulet in the north-west part of the bay, which collects its waters in the plain, but it barely finds a passage to the sea at the foot of the heights.

Cape Zeitin, which projects considerably to the eastward, bears N.E. by N. 3 miles from Zunaritsa point, and should not be approached within a quarter of a mile, as it is bordered with rocks. Baghlar point (Cape Korakas) lies 2 miles to the northward of cape Zeitin, and is safe to approach.

The GULF of BÚRGHAZ (Pyrgos) is the only part of the Black sea which affords several good anchorages. Its two extremities are Baghlar point to the southward, and cape Emineh to the northward, bearing from each other N. by E. $\frac{2}{3}$ E. and S. by W. $\frac{2}{3}$ W. 22 miles. The town of Búrghaz lies at the bottom of the gulf.

Kavak Bay.—About 2 miles to the south-eastward of Sizepoli, a tongue of land, nearly a mile in length, forms the north extremity of Kavak bay. In the N.W. angle of this bay several copious springs rise out of a bed of loose sand, about 2 cables from the shore. These, when united, would form a stream at which a fleet with a little management, by sinking casks, could obtain a supply of excellent water, clear as crystal, and of high repute for its wholesome quality. The spot is well indicated by circular clumps of trees at the sources of the springs.

Anchorage.—There is good summer anchorage off this bay for a fleet, at $1\frac{1}{2}$ miles from the springs, in 18 to 20 fathoms on mud. The coast of the bay appears to be bold, except about 2 cables south of the south-east point of the tongue, where there are some rocks above water. Large vessels should anchor with this point bearing to the westward of north.

SIZEPOLI (Cape Pribatchi).—This town, on the south side of the gulf, is built on a peninsula projecting two-thirds of a mile to the north-eastward, and is about a quarter of a mile wide. It is joined to the main land, which is high, by a low and narrow isthmus. Bakirli, an isolated mountain, of a round form, serves as a landmark for making Sizepoli, from which it is distant about 6 miles. Sizepoli bay, to the westward of the peninsula, is of a semicircular form, about 2 miles in breadth and $1\frac{1}{4}$ in depth.*

Joannes Island and Port.—A small island, of a triangular shape, named Joannes, or Petros, lies about $1\frac{1}{2}$ miles westward of Sizepoli, and forms, between it and the peninsula, a little port of about a cable in length and the same in breadth. The entrance is from the northward, and is much narrowed by rocks, which leave near the island a passage of from 40 to 46 feet in breadth, and which will only admit vessels of light draught. They anchor in from 2 to $2\frac{1}{2}$ fathoms over a sandy bottom, and are quite safe. This port has no outlet to the southward, as a bar of sunken rocks runs across it with only 3 or 4 feet water over them. There is a well of very good water on the island, but the large well, 33 feet deep, which supplies the town, would not be convenient for ships, even if it could afford a sufficient quantity for both such demands.

Megálo-Nisi, or Kyrios, a small island about half a mile in length from east to west, lies about that distance to the northward of Sizepoli, and $1\frac{1}{2}$ miles E. by N. of the Trinity convent, which stands on cape Trias or Syfitera Kavos, the little peninsula projecting out from the western shore, forming thus two passages into the bay. A vessel in taking the passage between the island and the town, which carries a depth in the middle of about 10 fathoms, should give the small islet of St. Peter, which is connected to the eastern end of Megalo Nisi by a reef, a berth of a cable's length, and also take care to avoid the shoal of $1\frac{1}{4}$ fathoms lying about 2 cables S.W. of Megalo Nisi island. The channel north of Megalo Nisi is the broadest, and has a depth of 11 to 13 fathoms in the middle.

LIGHT.—A *fixed* white light, elevated 131 feet above the sea, is exhibited from a lighthouse on Megálo-Nisi islet, and should be visible in clear weather from a distance of 15 miles.

Anchorage.—The best anchorage in Sizepoli bay is in the south-east part, in 6 to 7 fathoms, or in less water farther in, if desired. In the eastern part, about $2\frac{1}{2}$ cables west of the isthmus, there is a shoal with 4 feet on it.

* See Admiralty plan, gulf of Búrghaz, No. 2,399; scale, $m = 1\cdot 5$ inches.

Cape Nikoló lies nearly $1\frac{1}{2}$ miles to the northward of cape Trias, and is bold to approach. A bay is formed between it and cape Akin, which lies $1\frac{1}{4}$ miles to the N.W. by W., but vessels seldom anchor in it, although it carries a convenient depth of from 7 to 9 fathoms, as it is open to the N.E. A rocky spit runs off nearly 2 cables north-eastward from cape Akin, having, between its extremity in 5 fathoms and the cape, several rocks above water, with a depth of 8 fathoms between them and the land.

Cape Sarleati, or **Monopetra Athia Kavo**, which bears about W. by N. $1\frac{1}{2}$ miles from cape Akin, is bordered by a reef above water, and forms, with the latter cape, a bay of about a mile in depth, open to the northward. It affords safe shelter from south-easterly winds in from 5 to 9 fathoms over a bottom of sand; care must be taken to avoid a 9-feet shoal in the western part.

Anastatia Island.—At $1\frac{1}{2}$ miles W. by N. of Monopetra point is Anastatia or Papas island; it is small, and shallow ground encircles it for a short distance, with some dry rocks close off the south end. A lighthouse, convent and a mill stand on the island.

LIGHTS.—Two *fixed* white lights, placed vertically, are exhibited from a mast on a house on Anastatia island, the upper being 131 feet above the sea, and are visible about 6 miles. These lights are obscured southward of a line leading clear of the shoal ground extending off cape Akin, south side of the gulf of Búrghaz.

Sukála Point lies three-quarters of a mile S.W. of Anastatia island, between which and Monopetra point is another curved bay; it affords good anchorage in from 5 to 8 fathoms water, sand and mud. Off Sukála point a reef extends a short distance, and a shoal of $2\frac{1}{4}$ fathoms lies in the western part of the bay.

Katsevelo Scala Bay.—To the westward of Sukála point lies the excellent bay of Chingani, or Katsevelo Scala, about 2 miles in depth, and sheltered from all winds. Vessels that seek for shelter in the gulf of Búrghaz generally anchor in this bay, which is capable of berthing from 100 to 200 vessels. The greatest depth is about 8 fathoms, with 2 to 3 fathoms near the shore, over a bottom of mud, good holding ground. Small vessels that load with wine anchor close to the shore, near a rivulet at the bottom of the bay, where there are some booths and store-houses, which are, however, abandoned in winter. This landing place is named Chingani. A little to the westward there is another rivulet, which carries a great deal of mud into the sea, and which has formed a bank, with $1\frac{1}{2}$ fathoms at about 2 cables from the shore.

H.M.S. *Rapid*, November 1877, rode out a strong N.E. gale here, and found that, though a heavy sea ran directly into Búrghaz bay, little or no swell was felt inside the line of points forming the bays on the south side of the gulf, and that boats could land at all times. Water is easily obtained from the wells, which are close to the beach.

Poros Bay.—Poros point is bordered by a rocky shoal, which extends about 2 cables to the northward, and close westward of it is situated Poros bay, of about one mile in depth, having 5 fathoms at its entrance, which is open to the northward. As at Chingani, the country vessels that remain here during the bad season lie on the mud near the shore. There is a channel at the southern part of the bay, with from 3 to 18 feet in it, leading to a passage carrying a depth of from 2 to 2½ fathoms, which serves as an outlet to a large lagoon, or liman, named Akrianú Ghieul. This bay is reported to have shoaled.

BÚRGHAZ.—The western shore of Poros bay is low and sandy, and extends to the northward as far as the base of the high land on which stands the town of Búrghaz. At the northern end of this shore or spit, which separates the bay from Búrghas liman, or Muris Ghieul, (which is about 5 miles in length from east to west, and 2 miles in breadth,) the beach is only a cable across.

Búrghaz gulf with the exception of Katsevolo Scala bay has no watering place, and its northern side affords no anchorage for a fleet, being incommoded by extensive shoal water and by several insulated patches of rock and foul ground.”*

Búrghaz Reef.—A rocky bank, named Búrghaz reef, with 3½ fathoms, extends about 1½ miles south-eastward from the eastern angle of the town. The northern of the two miles west of the town open south of the Minaret leads southward, and Daghutli peak in line with the Tumulus leads eastward of the reef.

Anchorage.—Small vessels may anchor to the westward of Búrghaz reef, in about 3 fathoms, over a bottom of sand, between the reef and a sunken rock which lies 3 cables to the southward of the western portion of the town, but as the anchorage is open to the eastward, winds from that quarter throw in a heavy swell and short sea, and shelter must be sought in the southern bays if it should blow hard from that quarter.

Buoy.—A red buoy has been placed by the Austrian Lloyd Steam Company, in 20 feet, to mark the edge of the shoal water off the town.

Akhilú.—The town of Akhilú or Ankhélu bears E.N.E. 8½ miles from Búrghaz, and stands on a rocky point, which is connected to the

* Commander T. A. Spratt, H.M.S. *Spitfire*, 1854.

main land by a tongue of sand. The point is surrounded by a reef, which extends nearly three-quarters of a mile in a south-east direction, to the depth of 5 fathoms, and is called the Ankhélu S.E. reef, and $1\frac{1}{2}$ miles in a north-east direction to the same depth, and is named the Ankhélu N.E. reef.

Anchorage.—There is safe anchorage in the bight to the westward of the town of Akhilú with north-easterly winds, in about 5 fathoms, over a bottom of sand, at 2 or 3 cables from the shore. The outer anchorage to the southward, has about the same depth, over sand and mud, but vessels surprised here with easterly or south-easterly winds must run for shelter either in Poros or Katsevelo Scala bays.

Blonde or Búrghaz Rock lies E.N.E. $2\frac{3}{4}$ miles from Búrghaz point, and carries a depth of $4\frac{3}{4}$ fathoms; Muris Dagh peak, open southward of Búrghaz point, leads southward of the rock. Some rocky patches, named the Soka Shoals, having from $1\frac{1}{4}$ to 3 fathoms over them, lie about $3\frac{1}{2}$ miles north-eastward of Búrghaz point, in the north-west part of the gulf. Their outer edge in 4 fathoms is a mile from the shore.

Lakanathes Rock has only 3 fathoms over it, and lies a good mile S.E. $\frac{3}{4}$ S. of Akroteri point, on the northern shore of the gulf. Another rocky patch of 2 fathoms lies 4 cables South of the same point.

Spitfire Rock lies E. by N. $\frac{1}{4}$ N., $4\frac{1}{2}$ miles from Búrghaz point, and has a depth of 3 fathoms, with 6 fathoms close to its western side. Cape Emineh, open to the eastward of Akhilú point, leads eastward of the rock.

Stavro Rock lies about 2 miles S. by W. $\frac{1}{2}$ W. from Akhilú point and 3 miles East from Spitfire rock. Akhilú Minaret on with the high peak on the Balkan range, leads over its shoalest part in 15 feet.*

Ankhélu Bank.—The middle of a rocky bank, named Ankhélu, lies about $1\frac{1}{2}$ miles S.W. $\frac{1}{2}$ S. of Akhilú point. It is about half a mile in length from north to south, and from 2 to 3 cables in breadth, and carries a depth of from $3\frac{1}{2}$ to 5 fathoms on it.

Crescent Shoal has from $4\frac{1}{2}$ to $5\frac{1}{2}$ fathoms on it, and lies $1\frac{1}{2}$ miles to the eastward of the Ankhélu bank. A sandy patch of 5 fathoms lies half a mile to the southward of this shoal.

Rhavtha Burnú.—From Akhilú point the coast runs northward for $4\frac{1}{2}$ miles, and then bends round eastward, to Rhavtha Burnú, forming a large bay of $1\frac{1}{2}$ miles in depth to the westward. Several rocky patches exist in this bay.

Chemose Rocks lie nearly in the middle of the bay, about three-quarters of a mile from the shore, and have from $3\frac{1}{2}$ to 5 fathoms on them.

* See Views A and B on Admiralty plan, gulf of Búrghaz, No. 2,399.

Rhavtha Rock has 3 fathoms on it, and lies three-quarters of a mile S.S.W. of Rhavtha point. The western extreme of the town of Messemvria open of Kavo Kroti, leads $2\frac{1}{2}$ cables eastward of the rock. Rhavtha Burnú lies about half a mile to the southward of the village of Rhavtha, and is bordered by a rocky reef extending a quarter of a mile from the shore.

Water.—A summer watering place for a fleet will be found at the river Chemose, which flows into the sea between Messemvria and Akhilú, near the hamlet of Chemose. It is next in size to the Kamtchy, and is said to run all the summer. Both these rivers are very turbid at this season; but the quality of the water is considered to be not the less wholesome from the discolouring sediment. Launches can approach close to the Chemose, and water from it with convenience.

Anchorage.—There is anchorage off Chemose during the summer season in 12 fathoms on a muddy bottom; but not nearer the mouth of the river than 2 miles for a fleet, owing to the several shoals which contract the inner anchorage.

Messemvria.—This town, like that of Akhilú, occupies the whole rock on which it is built, and is connected to the main land by a narrow isthmus of sand, which is sometimes covered by the sea. The rock is nearly surrounded by a reef, which extends from it nearly half a mile to the south-eastward, and is about the same distance in breadth.

The anchorage to the southward of the town is abreast of the isthmus in a small bay, in from 5 to 8 fathoms at 4 cables from the shore, over a bottom of sand and shells. There is anchorage also to the northward of the isthmus in about 7 fathoms, but vessels are here exposed to the northerly winds, which precipitate themselves furiously from mount Emineh.

From Messemvria the shore becomes sandy, and curves to the northward, for about 3 miles, when it bends abruptly to the eastward, and runs in a straight line for nearly 8 miles to cape Emineh, forming a large bay, which affords very good anchorage all over it from 10 to 12 fathoms. It is open from east to south, and vessels that run in for shelter generally anchor in its western part, which is called Karidies.

Gales.—In winter, gales which blow from N.N.E. to East generally commence more westward; a heavy swell, however, assures the sailor that the wind will shift. Advantage should be taken of this N.W. wind to gain an offing, unless an anchorage can be secured. Should the vessel be between cape Emineh and the Bosporus she may reach shelter before thick weather comes on, at Inada road.

CAPE EMINEH is a bold-looking headland, with a monastery on it dedicated to Saint Nicholas. From the southward it appears as an island. A few rocks extend about 2 cables eastward of it, and a depth of 5 fathoms will be found at half a mile from the shore.

LIGHT.—From a lighthouse situated 50 feet from the extremity of cape Emineh, is exhibited at an elevation of 207 feet above the sea, a light which *flashes every ten seconds*, and visible in clear weather from a distance of 20 miles.

Water.—The coast under the cape affords no watering place for a fleet after July, as the only streamlet which flows from the Balkan to this part of the coast is then insignificant, if not quite lost in the upper part of the valley. This streamlet descends through the first ravine to the westward of cape Emineh, about 2 miles from it.

Anchorage.—The best anchorage under the cape seems to be between this ravine and the next conspicuous valley, about $1\frac{1}{2}$ miles farther west, off which the bottom is mud.

The **coast** from cape Emineh takes a N. by E. direction for $28\frac{1}{2}$ miles to cape Galata, and the following points and anchorages are between them:—Kotsan point is 4 miles to the northward of cape Emineh; and cape Aspro or Ak Burnu (White point), $6\frac{1}{2}$ miles to the northward of Kotsan; breakers were seen in 1830, extending three-quarters of a mile eastward of the cape. There is anchorage abreast of the village of Joski (Keoscheh), which lies about 3 miles southward of cape Aspro; it affords some shelter with north-westerly winds.

Aspro village lies about one mile southward of cape Aspro. The roadstead abreast of the village is open from north, round by the eastward to south. From cape Aspro the coast inclines a little to the westward of north for 5 miles, up to the mouth of the river Kamtchy, and from thence for 2 miles a little eastward of north to Ilanjik point.

KAMTCHY RIVER.—**Water.**—The first watering place, to the southward of Varna, is at the mouth of the Kamtchy, a river which issues about 10 miles southward of cape Galata. A broad and wooded plain breaks here through the hills and white cliffs, and the river winds round the northern edge of this plain or valley. It runs throughout the summer, and inside the bar was found to carry a depth of 16 feet for more than a mile above the entrance.

The river has a bar of 2 to 3 feet depth, but launches can anchor at a convenient distance outside, and water from the river with long hoses. A low hill terminates on the other side of the river, at pistol-shot distance, with much cover from brushwood upon the top and rear of the ridge.

Firewood.—A thick forest grows on the banks of the river, and supplies Constantinople with large quantities of firewood. Large stacks of billets are generally lying on the beach for sale, both at this river's mouth and on other parts of the coast, and are sold at the rate of 30 piastres per 1,000 okes, or about 1 dollar per ton.

Anchorage.—There is good anchorage off the Kamtchy during the summer, in 10 fathoms water on a bottom of mud, at a distance of 1½ miles from the shore ; and no large vessel should approach nearer to its mouth than a mile, as a bank of rock and gravel exists at half that distance, on which there are depths of 2½ and 3 fathoms with 7 fathoms within it.

Between the Kamtchy and cape Emineh there are two valleys—the Keosako and Bana—each of which has its rivulet : but, as they are said to fail near the sea after a month, they require no further notice. At Keosako it is stated that 200 or 300 cattle could be procured after a day or two's notice, and with the authority of the pasha of the district, but not otherwise. Wood is also stacked on the shore, and selling at the same price as at the Kamtchy. From Ilanjik, cape Galata bears N.N.E. about 8 miles, and the depths between them are 5 to 10 fathoms at about a half to 1½ miles from the shore.

CAPE GALATA.—LIGHT.—From a white stone tower erected on cape Galata, is exhibited at an elevation of 164 feet above the sea, a *fixed* white light, visible in clear weather from a distance of 10 miles.

VARNA BAY.*—From cape Galata the coast bends in abruptly to the westward, forming Varna bay, the entrance to which lies between cape Galata and cape St. George, or Gorgof, bearing from each other N.E. ¼ E. and S.W. ¼ W. 4 miles. The bay is spacious, with good holding ground, composed of mud and sand, and well sheltered from southerly, westerly, and northerly winds, but open to easterly winds, which, it is said, seldom blow home. It carries a depth of 10 to 5 fathoms, the latter depth being found at from 2 to 5 cables from the shore all round the bay.

Anchorage.—The best anchorage is about three-quarters of a mile south-eastward of the town (which is built on a promontory at the head of the bay, in about 7 fathoms, taking care to avoid the patches of foul ground which lie about 3½ cables from the southern shore. Small vessels cannot come very near the landing place northward of the town, for the accumulation of mud, stones, and anchors, make the approach to it even difficult

* See Admiralty plan of Varna bay, No. 2,285 ; scale, $m = 2\cdot75$ inches.

for boats. Vessels sometimes anchor eastward of the town, in from 6 to 7 fathoms water, over mud and sand.

Foul Ground.—The foul ground lying in the southern part of Varna bay bears N.W. $\frac{1}{3}$ N. three-quarters of a mile from Galata lighthouse. It appears to be about 50 feet in length, with two heads of $3\frac{1}{2}$ and $4\frac{1}{2}$ fathoms, upon neither of which will the lead remain, with 6 fathoms around it at only a few feet distant. A red upright buoy has been placed close to the rock,* but the ground is foul for anchoring nearly 2 cables each side of the buoy, there being other columnar points of rock rising to within $4\frac{1}{2}$ fathoms of the surface at two-thirds of a cable westward of the buoy, with possibly less water on them, as the pinnacles are so small that the lead will not remain upon their summits. The bottom, within the distance of 2 cables of the buoy, appears to be rock, thinly covered with sand.

VARNA has a population of 24,000, and a British Consul resides here. The sea face is defended by powerful batteries, and on the land side the town is surrounded by a loop-holed wall, with bastions mounting guns of large calibre. It may be considered a second-class fortress, capable of making a protracted defence. Varna is connected by electric telegraph with Vienna, Paris, London, the Crimea, and Constantinople, and by a railway with Rustchuk.

LIGHT.—A fixed red harbour light is shown from a mast on a house on the south-east corner of the wall of the town of Varna; it is 49 feet high, and visible 4 miles.

Buoy.—A red mooring buoy belonging to the Austrian Lloyd Co., lies in 5 fathoms near the town, with the harbour light bearing N. 5° E. distant $4\frac{1}{2}$ cables.

From the town of Varna the coast trends away E. by N. towards cape St. Demetrios and cape St. George, and the water shoals gradually to within $3\frac{1}{2}$ cables from the shore, with the exception of some foul ground, which lies about half a mile eastward of the town, at 3 cables from the shore.

Cape St. George.—The north-east point of Varna bay, named cape St. George after a monastery behind it, should not be approached nearer than $2\frac{1}{2}$ cables, as some foul patches lie fully $1\frac{1}{2}$ cables off the cliffy points.

St. George or Chingani Reef.—The St. George reef lies N.E. $2\frac{1}{2}$ miles distant from the cape, and consists of several rocky points extending nearly half a mile along the coast and the same distance off it,

* Buoy not in position in 1883.

over which there are only 3 and 4 feet water. There is shallow water for half a mile outside the rocks, so that no vessel should approach the coast nearer than $1\frac{1}{2}$ miles, or shoal her water to less than 10 fathoms either abreast or to the northward of the reef. The marks for clearing the reef are, the western end and summit of mount Galata, (the highest flat hill south of Varna bay,) a little open east of cape St. George.

KAVARNA BAY.—The vast curve that the coast of Bulgaria takes to the northward and eastward, between cape St. George and cape Kaliakra (Jelegra), which bears E. by N. $\frac{1}{2}$ N., distant 22 miles, is named Kavarna bay, in which are the smaller bays of Batova, Baljik, and the roadstead of Kavarna.

Reef.—The southern end of a long reef, carrying a depth of 2 fathoms, lies about 3 miles N.E. $\frac{1}{2}$ N. from cape St. George, and from thence it runs the same distance, nearly parallel to the shore. Its outer edge, in 3 fathoms, is about half a mile from the coast, and the position of its centre is abreast of the space which separates the second and third cliffs to the northward of the cape.

Batova Bay lies 9 miles N.E. by N. of cape St. George, and abreast of a thickly-wooded and very swampy plain, across which W.N.W. winds blow with great strength. The anchorage is in 7 or 8 fathoms, about $1\frac{1}{4}$ miles from the shore.*

Baljik Bay.—Anchorage.—Baljik bay, which is abreast of the village of that name, lies about $3\frac{1}{2}$ miles north-east of Batova bay, and in the north-west bight of the great bay of Kavarna. It serves as a place of refuge for vessels, not only in northerly winds during the winter months, but from all bad weather. It is open to S.E. and South winds, which the natives say never blow home, and therefore allow their vessels to winter there with great confidence. The anchorage is to the southward of the village about three-quarters of a mile from the shore, in 5 to 6 fathoms muddy bottom. There is good anchorage for a fleet in Baljik bay, sheltered from the prevailing winds, over a bottom of tough clay gradually shoaling to the coast.†

Water.—Any quantity of water may be obtained from a stream situated half a mile westward of the village of Baljik.

The village of Kavarna is built in a narrow valley, 9 miles to the eastward of Baljik, and about the same distance north-westward of cape

* See Admiralty plan of Baljik bay, No. 2,287; scale, $m = 1\cdot 85$ inches.

† The anchorage in Baljik bay is far preferable to that of Varna, in which bay there is a considerable sea with winds from N.E. to S.E.—The combined fleets anchored here in 1854; the British flag ship being anchored in $7\frac{3}{4}$ fathoms, with centre of Baljik N. by E. $\frac{1}{2}$ E. distant $1\frac{1}{2}$ miles.—Remark Book of Mr. W. T. Mainprise, Master of H.M.S. *Britannia* (flag ship), 1854.

Kaliakra. Its roadstead also serves for shelter to vessels in bad weather, but they are not equally safe as in that of Baljik, for the bottom is not so inclined at this receding portion of the coast. The anchorage is at the same distance from the shore, and in the same depth of water as that of Baljik.

CAPE KALIAKRA, or Jelegra, which rises 80 feet above the sea, is the southern extremity of a small peninsula of about 800 yards in length, and 200 broad. Its shores are sloping, and of a reddish colour, and from a little distance to the eastward it appears quite isolated from the main land, which is higher. The cape is bordered by a reef, to which a berth of a cable must be given in passing. Shelter in N.W. winds may be found under the cape.

LIGHT.—From a white tower near the extremity of the cape, is exhibited at an elevation of 164 feet above the sea, a *revolving* white light which attains its greatest brilliancy *every minute*, and should be visible in clear weather from a distance of 16 miles.

Cape Kaliakra is remarkable for its prominence, as well as for its being a point of demarcation. The western coast of the Black sea affords in the space of 100 miles to the southward of this cape (at the foot of mountains generally very picturesque) a great number of bays, coves, and harbours, more or less secure; but to the northward the aspect of the coast changes to a moderate height and level surface with shores slightly intersected, affording but little shelter all the way to Odessa. It is also near Kaliakra that the bottom of the basin of the Black sea rises suddenly to the depth of about 50 fathoms, and continues so as far as the Krimea, towards Eupatoria and Sevastópol, where it rises to 70 fathoms, from a bottom which just before could not be found at 100 fathoms, which circumstance may be useful to seamen.*

Cape Shableh.—From cape Kaliakra the coast takes a north-east direction for $12\frac{1}{2}$ miles to cape Shableh (Beacon), on which may be seen a tower built in a form of a pyramid, and a little farther on, a hillock. In passing this cape give it a berth of $1\frac{1}{2}$ cables; from thence the coast trends almost due north as far as cape Midia.

LIGHT.—From the white stone tower on cape Shableh, a *fixed* white light is exhibited at an elevation of 82 feet above the sea, visible in clear weather from a distance of 10 miles.

MANGOLIA (Mangali).—This small town lies 16 miles to the northward of cape Shableh, and may be recognized by its little hills. The port is open to the commerce of all nations. Vessels generally anchor

* See Admiralty chart:—Cape Kaliakra to Odessa, No. 2,231; scale, $m = 0.17$.

abreast of the town, about a mile from the shore in $5\frac{1}{2}$ fathoms, but smaller vessels may anchor in 4 fathoms at $1\frac{1}{2}$ cables from the shore northward of some isolated rocks, which are supposed to be the remains of an old mole, and which lie between 2 and 3 cables southward of the town, abreast of a little valley, through which a small river flows, and which forms itself into a lagoon on the beach. The roadstead is open to the eastward.

Cape Touzlah is 11 miles to the northward of Mangalí, and is of moderate height and sloping. A few rocks run out a short distance from the cape, and between it and Kustenjeh is a large and small lagoon, named Soujoli lake.

KUSTENJEH (CONSTANTA).—This town lies 11 miles to the northward of cape Touzlah, and is built on a promontory projecting half a mile south-eastward, which shelters its road from northerly winds, but it is open from the N.E., as far round as south.

Kustenjeh is one of the nearest points on the Black sea to Chernavoda on the Danube, from which it is but 29 geographical miles distant; in 1837 a design for a canal between these points was found impracticable for want of water at the summit level, 164 feet in elevation, at 2 miles from the Black sea; a railway has been constructed instead, and is the principal conveyance for the grain which is grown in the adjoining districts, to the steamers, for transport to the European markets. A fort has been constructed on the tumulus, 198 feet high, northward of the town.

Anchorage.—The ordinary anchorage is in from 4 to 6 fathoms, over a bottom of sand and mud, about three-quarters of a mile south-west of cape Kustenjeh, but small vessels approach nearer the shore, where they lie sheltered by the town and by jetties from easterly winds. The holding ground there, however, is bad, being a continuation of a bank of coarse sand, which runs along the coast to the southward, about a third of a mile from the shore. A rocky patch, with only $1\frac{1}{2}$ fathoms on it, rises from the sand bank at $1\frac{1}{2}$ miles to the S.W. of the town, abreast the Tumuli, nearly two cables from the shore.*

Harbour.—The harbour has a depth near the eastern and southern jetties of 19 feet, and can accommodate about seven steamers alongside, about as many more at moorings, and a number of small coasting vessels.

LIGHTS.—From a white tower on cape Kustenjeh is exhibited at an elevation of 68 feet above the sea, a *fixed* white light, visible in clear weather from a distance of 9 miles.

* See Admiralty plan of Kustenjeh, No. 1,233; scale, $m = 2$ inches.

Also a fixed *red* is exhibited from the extremity of the southern jetty, visible 2 miles.

Pilots meet all vessels arriving off the port, weather permitting.

Supplies.—Vessels will find Kustenjeh a cheap and convenient place for coaling. Excellent water is brought in by rail in tanks from Morfatlar, at a cost of about 3*s.* 4*d.* per ton.

Pratique.—The visé of the Roumanian legation at Constantinople is necessary upon the bill of health of all vessels arriving from there.

Winds.—From May to August, the land and sea breezes are fairly regular, the sea breeze between N.E. and S.E. coming in about 9 a.m. and lasting till sunset ; the land breeze, N.W. to S.W. springing up about 3 a.m. and dying away about 8 a.m.

Occasionally during this period, a strong N.E. breeze was experienced, and at times, strong westerly breezes accompanied by rain, lightning and thunder. A dull, humid atmosphere gave notice of these thunder storms.*

Cape Kustenjeh with its lighthouse, is the eastern projection of the promontory, and is bordered by some rocky uneven ground, extending upwards of half a mile to the eastward from the cape, where there is a rocky patch carrying a depth of $3\frac{3}{4}$ fathoms. Care must be taken in approaching the land to the northward of the cape, for between it and Singholi point, which lies $2\frac{1}{4}$ miles to the northward, there are several rocky patches, more or less dangerous, lying nearly $1\frac{1}{2}$ miles from the coast.

Cape Midia bears N. by E. $\frac{1}{2}$ E. about 8 miles from Singholi point, and affords but slight shelter from northerly winds. The little town of Kara Irman stands $2\frac{1}{4}$ miles north-eastward of the cape, and has an open roadstead. Northward of the town the coast becomes low and sandy, which indicates the approach to the mouths of the Danube.

Portici.—Anchorage.†—The southern mouth of the Danube, named the Portitza, is 24 miles north-eastward of cape Midia, and leads into Razem lake. From thence the shore of Dranova island, which forms part of the delta of this river, trends for 28 miles to the eastward, up to St. George's mouth, and affords good shelter from northerly winds, in about $5\frac{1}{2}$ fathoms, over mud and shells, at $2\frac{1}{2}$ miles from the coast. Eight buoys in line mark this anchorage, at $2\frac{1}{4}$ miles apart, a red buoy being at each end, with 6 black buoys between ; a wooden beacon on the shore serves to lead to the western buoy.

* Remark Book ; Navigating Officer H.M.S. *Rapid*, 1877.

† See Admiralty plan of Razem lake, on chart No. 2,835.

St. George Mouth.—This mouth of the Danube is $1\frac{1}{2}$ miles across from lower Olinka island to St. George point; it is blocked up by extensive sand banks with 3 feet water over them, and it has three islands in the entrance; the channel is close past St. George point, over a bar of about 3 to 5 feet, between breaking sand banks, nearly dry; the depth increases to 24 and 30 feet when inside, off the village of St. George or Kedrelles. Another channel, beginning with a flat of 3 to 4 feet depth, lies between the Olinka islands and the western shore.*

Since the improvements at the Sulina mouth, this entrance to the Danube is not used so much as formerly, except by fishing boats.

LIGHT.—From a wooden tower, on the south end of Sandy island, a *revolving* light is shown, alternately red and white at *one minute* interval; it is 65 feet in elevation, visible 10 miles. The eclipses are total.

THE SULINA MOUTH, or middle entrance to the Danube, is 17 miles to the northward of the St. George, and is the only branch made use of for commerce, on account of the greater depth at its mouth. It extends 44 miles inland, including its numerous windings from the sea to Tchatal point, and varies from 3 to $1\frac{1}{2}$ cables in breadth. Its banks in some places are 7 feet high, and never less than 4 feet, and it carries a depth of from 13 to 50 feet, which at the mouth averages $20\frac{1}{2}$ feet.†

The depths are liable to change, and will generally be least outside the pier-heads about June, July, and August.‡

The depths between the piers will be least in the winter months before the descent of the river floods, which generally commences in March. The depth of water, (in feet,) on the bar, is shown in figures from the old lighthouse, so as to be visible from the bar by the aid of a telescope, but the pilots are bound to board vessels when weather permits, or to signal how they may enter.§

Currents.—The current sets down the river and varies from one to 3 knots per hour, according to the volume of water in the river. The direction of the current in the offing is S.S.E., from one quarter to half a knot; the surface water, to the depth of about 3 feet, is influenced by the wind.

LIGHTS.—Sulina old lighthouse, standing on the right or southern bank of the entrance, is built of stone, circular, and white with green top;

* See Admiralty chart of St. George mouths, No. 2,505; scale, $m = 4\cdot 3$ inches.

† See plan of Sulina branch of river Danube; scale $m = 7\cdot 5$ inches, on Admiralty chart, No. 2,207, and the Delta of the Danube, No. 2,835; scale, $m = 0\cdot 5$ inches.

‡ On July 24th, 1881, there was $20\frac{1}{3}$ feet of water on the bar, an extraordinary height for that time of the year.—*Shipping Gazette*, 2nd August 1881.

§ A blue flag at the lighthouse denotes that the pilot cannot come on board.

it exhibits at 65 feet above the level of the sea a *fixed* white light, visible in clear weather, 15 miles, from N. by W. through west to S. by W.

At the eastern or seaward end of the North pier, from a white circular iron tower with green top, there is exhibited at an elevation of 43 feet above the sea, a *fixed* red light, visible 6 miles.

Village.—The village, which includes the principal buildings of the European Commission, the Seaman's hospital, pilot and life-boat stations, is situated on the south bank of the river, and the workshops and the houses of the employés of the European Commission are on the north bank of the river.

Buoy.—A bell buoy is placed off the entrance in 18 feet, vessels should pass to the northward of it.

Caution.—As the effect of a river flood is the extension and shoaling of the south bank off the entrance (Sulina spit), and the buoy is liable to be swept away by storms, also, on account of a strong littoral current during the prevailing northerly winds, vessels are cautioned to keep well to the northward on entering or leaving the river.

Vessels which are unable to proceed up the river loaded, have recourse to lighters, but there are frequent complaints about the masters of them who must be well looked after.

There is no dock accommodation at Sulina. A rude slipway, worked by capstans and tackles, is available for tug boats and very small craft.

Trade.—The total number of vessels entering the Sulina mouth in 1876, was 1,943, with a gross tonnage of 748,363 tons; of this number, 521 were English steamers, with a gross tonnage of 444,964 tons; the export of grain and maize amounted to $7\frac{1}{2}$ million quarters.

Directions.—The master of a vessel who has never been at Sulina should take his departure from Fido-Nisi or Serpent island, which bears about E. $\frac{3}{4}$ N. 24 miles from the North pier lighthouse, and steer W. $\frac{1}{2}$ S., when, if the weather is clear, he will make, right ahead, Besh Tepeh, a remarkable mountain, rising from 700 to 800 feet above the sea. The lighthouses and the buildings on both banks of the river will soon rise to view, when the old lighthouse just open south of the pier lighthouse bearing W.S.W. should be steered for, which will lead into the deepest water, and over the bar in about 20 feet northward of the bell buoy; a pilot is instructed to visit the vessel before she arrives at the buoy. Pilotage is compulsory for vessels over 60 tons; the rules of the port can be obtained from the pilots. Since the completion of the piers in 1861, the water in the entrance has deepened from 12 to 21 feet; this depth cannot always be depended on.

The water becomes very muddy as the river is approached, a fact worthy of notice in thick and foggy weather.

With contrary winds, the passage from the mouth of the river to Ismail may take a vessel a month or more, for the only wind that will serve her through all the curves of the river, without having recourse to the tow rope, is that from E.S.E. The direct distance is 37 miles, by the windings about 63 miles.

To haul a vessel up this branch with her crew, a two or three inch line should be rove through a block lashed at the fore topmast head, and the running part sent on shore, the standing part being made fast to the deck, to be eased off when passing the reeds and trees that are to be met with on the passage, bearing in mind that there is no danger of grounding where the banks are high and perpendicular, and that the shoals that run off the points at every turning of the river, and also the trees and reeds must be avoided.

As it is dangerous to have the anchors a-cockbill or outside the vessel, they should be either fished or hoisted on board, as they may be the cause of accidents in grounding suddenly; but a kedge, which it is necessary she should be supplied with, should always be in readiness to secure her, if she is too late to moor to stakes on the shore. Having advanced as far as Tchatal point, a vessel cannot proceed any farther by hauling, as there is no pathway on the right or port bank of the river, and the Cossacks that infest the left bank object to it.

Tugs.—Powerful tugs can always be obtained.

Flats in River.—The flats in the river which formerly impeded navigation in the Sulina branch have been removed by the European Commission. The river is, however, always subject to change, and new shoals often form, which are immediately removed. The banks which extend from the shore in the Sulina branch, have piles on their outer edges in 12 feet (low water); banks in the channel are marked by red buoys, when the deepest water is southward of them, and by black buoys when the deepest water is northward of them.* The least depth in the Sulina branch (1877) was 13 feet, during the autumn, when the river is low.

Dredging operations.—Portions of the river being dredged are marked by beacons, (hogsheads hoisted on masts,) and steam vessels are directed, under penalties, to proceed as slow as possible consistent with safety when passing these places, whether the dredger is at work or not.

ICE.—From an average of 37 years registrations, taken at Galatz, the waters of the Danube may be said to freeze in the first ten days of

* Remark Book of Navigating Sub-Lieutenant J. C. Roughton, H.M.S. *Cockatrice*, 1870.

January and the ice to break up during the last ten days of February, a period of about 40 days. In the year 1863, the river was frozen as early as the 7th December. The longest period of the river being frozen, in the 37 years under consideration, was between 17th December 1841, to 21st March 1842, or 94 days; and for 8 years in the same period, the river was free of ice. At Sulina, the river is only frozen in the severest winters, and is practically always open.

The Kilia branch, on account of its shallowness, and the number of shallows and islets at its mouths, is now abandoned. In thick weather, it is advisable not to stand into less than 10 fathoms between this branch and the Sulina branch.

Fido Nisi or Serpent Island.—This little island, called by the Greeks the island of Serpents, bears E. $\frac{3}{4}$ N. 24 miles from Sulina lighthouse, and is about 3 cables in length from N.E. to S.W., and $1\frac{1}{2}$ miles in circumference; its shores are composed of cliffs. There are several landing places, but the two best are those at the north-east and south ends of the island. There are about 3 or 4 fathoms a third of a cable from the northern shore, 4 to 7 on the western, 5 to 10 on the southern, and $3\frac{1}{2}$ to 8 fathoms on the eastern shore, but the bottom is foul.*

Anchorage may be found 3 cables south of the lighthouse, in 11 fathoms, which affords good shelter from winds between N.E. and N.W.

LIGHT.—A white lighthouse 71 feet in height, stands on the highest point of the island, from which is exhibited at an elevation of 195 feet above the sea, a revolving white light, attaining its greatest brilliancy every *half minute*. The light is visible 18 miles, and the eclipses are not total within eight.

Aspect of Coast.—Beyond the Kilia mouths of the Danube, the coast runs north-eastward for about 80 miles to Odessa, presenting more and more, as that town is approached, a flat surface of no great height, with reddish and perpendicular shores, and with salt lakes appearing at intervals, as far up as the mouths of the Dniestr.

Bank.—There is a depth of $4\frac{1}{2}$ fathoms all along this coast, about a mile from the shore, and 7 fathoms at from $2\frac{1}{2}$ to 3 miles, with the exception of a bank 4 miles in length, carrying a depth of only 3 fathoms, and lying 15 miles to the northward of the Kilia mouths, between the first and second salt lake, at about $2\frac{1}{2}$ miles from the shore.

Balaban Cliff.—At 35 miles north-eastward from the Kilia mouths is the high cliff of Balaban, which may be seen at a good distance off. It is

* See plan on Admiralty chart, No. 2,207, and the Delta of the Danube, No. 2,835.

sometimes called a cape, although not at all prominent, and when seen from seaward it appears isolated between two large salt lakes.

DNIESTR ESTUARY.—About 17 miles north-eastward of Balaban is the entrance to Dniestr estuary or Ovidio lake, which is a large lagoon or salt lake, formed by the waters of the Dniestr before they reach the sea. It is 21 miles in length, from north-west to south-east, $2\frac{1}{4}$ in breadth between Akerman and Great Otorek point, and 6 miles in its broadest part, and has a depth of from 4 to 9 feet. The town of Akerman and the village of Chaba are situated on the south shore, and the villages of Kaloglei, Ovidiopol, Roksolyani and Carolina on the northern shores.*

The entrance to the Dniestr estuary, which is recognized by a space of 5 miles between the cliffs, is formed by two tongues of sand with a low island in the middle, which allow the waters of the river a passage at either end. The channel to the northward is named the Ochakov mouth, and has a depth of about 3 feet, but it is not used; that to the southward is the Tsarigrad mouth.

Dniestr Bank.—A bank of 3 feet connects the town of Akerman on the south shore, to the Dniestr river entrance, with from 6 to 8 feet in the basins north and south of it.

Lifeboat.—A ten-oared lifeboat has been established at Bugasso, mouth of the Dniestr.

Tsarigrad Mouth.—The Tsarigrad mouth is alone made use of by vessels entering the estuary of the Dniestr, and it sometimes has a depth of from 10 to 12 feet, but is much influenced by the wind.†

LIGHTS.—Two leading lights are exhibited from black beacons erected on the south-west side of entrance to Tsarigrad mouth. From the western beacon, at an elevation of 46 feet above the sea, a *fixed* white light is exhibited visible 8 miles; and from the eastern beacon, 17 feet above the sea, a *red* light visible 5 miles.

The lights or beacons in line denote the best water over the bar. When changes in the channel prevent the beacons in line being used as a leading mark, the east beacon light will be masked, and the white light on the west beacon alone be shown.

Buoys.—The channel is marked by buoys. There is a pilot station on the south-west side of entrance.

Caution.—As the channel entrance is subject to frequent change from the continuance of N.E. or S.E. winds, the line of lights and buoys are altered as required. The channel is very narrow, and it would not be prudent for a stranger to attempt it.

* See Admiralty plan of Dniestr estuary, No. 2,208; scale, $m = 0\cdot 9$ inches.

† Depth in May 1884 was only 7 feet. From Notice to Mariners, No. 100 of 1884.

Directions.—In turning to windward along this coast great attention should be paid to the lead, as the variety of soundings has often occasioned shipwreck. It has been stated previously, that all along this coast from the Kilia mouths of the Danube to Odessa, the depth of $4\frac{1}{2}$ fathoms is to be found about a mile from the shore, but this depth will be found near the mouths of the Dneistr at 2 miles off, and also all along the coast to the north-westward at the same distance from the shore, until abreast of the lake near the village of Lutsdorfi, which lies 3 miles to the southward of cape Fontana.

Off-lying Banks.—Exposed to the action of the current and the alluvial deposits of four great rivers, the gulf of Odessa offers several very curious variations in depth, which might sometimes cause great uneasiness to the seaman in thick weather. The first bank is of large extent, and lies about 7 miles E.S.E. of the low island between Tsarigrad and Ochakov mouths; it has a depth of 6 fathoms, with from 8 to 15 fathoms around it.

About 2 miles northward of this bank, and E. $\frac{1}{4}$ N. distant 8 miles from Tsarigrad beacon mast, is a shoal of $4\frac{1}{2}$ fathoms.

At 20 miles E. by S. of Tsarigrad beacon, and S. by E. $\frac{3}{4}$ E. 22 miles from cape Fontana, is another bank with 7 fathoms, and 10 to 15 around it; and at 39 miles, S. by E. $\frac{1}{2}$ E. from cape Fontana, is a fourth bank, with a depth of 11 fathoms, and from 12 to 17 fathoms around it.*

Compass Variation.—Caution.—From an investigation made in 1882, it has been reported that local magnetic disturbance exists in the space comprised between these off-lying banks and Odessa, and in consequence the variation is increased a quarter of a point on approaching that port. Caution should be exercised when navigating in this locality in thick weather; more to seaward the disturbance vanishes.†

Coast.—On approaching Odessa the country appears covered with houses and mills; two ravines will also be seen; in the first, lies the Sukhoi liman (the dry salt lake), which is of considerable extent, and the village of Lustdorfi occupies the other.

CAPE FONTANA.—LIGHT.—This cape, situated about 6 miles southward of Odessa, rises perpendicularly to 124 feet above the sea. From a white, circular lighthouse 91 in height erected on the cape, is exhibited at an elevation of 200 feet above the sea, a *fixed* white electric light, visible in clear weather from a distance of 16 miles. Near the lighthouse is a monastery.

* See Admiralty chart, cape Kaliakrai to Odessa, No. 2,231.

† St. Petersburg Notice, No. 47 of 1882.

The coast between the cape and Odessa is safe to approach to within 3 or 4 cables. A very conspicuous mill, with several church spires and domes, may be seen as the bay is neared, and the lighthouse on cape Fontana will be concealed from view by a projection of the land named Little Fontana.

Current.—Between the western extremity of the Tendra peninsula and cape Fontana, but more particularly near the latter, a vessel will feel the influence of the current which runs from the rivers Dniepr and Búg to the S.S.W.

Bank.—A bank with 9 feet water, has been found nearly 3 cables from the shore, and bearing S.E. by E. $\frac{3}{4}$ E. from Odessa cathedral. (Position doubtful.)

ODESSA.—This city, though not immediately at the mouth of any great river, is on the shore, which is a continuation of that of the channel or estuary receiving the streams of the Dniepr and the Búg, and within a few miles of the mouth of the Dniestr. It is likewise well situated with regard to the Danube, being little more than 95 miles from the Sulina mouth, and it has a clear navigation to the Bosphorus, in which it can successfully compete with any of the northern ports in the Black sea. An artificial harbour has been built which accommodates a large number of shipping.*

The city, which ranks third in the Empire, is situated upon a hill, which descends rather abruptly towards the sea. In 1882 it had a population of about 217,000 persons, consisting principally of the garrison, visitors who come for bathing, merchants, and others engaged in the export trade.

The city has a pleasing aspect both in the interior as well as from the outside. In the direction of the sea it is particularly ornamented by a row of splendid houses, a handsome walk, planted with trees, occupies a considerable space between this row of houses and the ridge of the hill, where it descends somewhat precipitously.

A magnificent flight of steps leads down the declivity to the shore and harbour. It is about 200 feet broad, with a height of 80 feet. The blocks of stone of which the steps are composed are supported by arches, and the space between is open for traffic. The city has two suburbs, one of which is at the foot of the hill; besides this, twelve villages are included in Odessa.

Trade.—The exports consist almost entirely of corn, cereals, flour, and wool, the total yearly value of which is about 80,000,000 roubles.

* See Admiralty plan of Odessa bay, No. 2,206; scale, $m = 3\cdot25$ inches.

The total number of arrivals of all nations excluding the coasting trade (1882) was 1,215 vessels of 1,112,708 tons ; of these 988 were steamers, and of which 526 were British.

A serious drawback to the trade of Odessa is that the harbour is frequently frozen up. This year (1883) navigation was stopped from 17th to 21st January, 26th January to 6th February, and 8th to 26th February ; in 1876 it was stopped from 4th to 27th January. This is felt by shipowners to be avoidable, and this year when English shipowners guaranteed the payment of expenses, steps were taken by sawing and gunpowder to effect an entrance, and a sufficiently large channel was opened in three days. As vessels can always force their way through the ice to within half a mile of the end of the moles, it would be only necessary to keep open a channel for the distance of a mile.

None of the more recent inventions for lessening the cost of shipment, such as elevators, are in operation, though they have been contemplated many years.*

Harbours.—The inner harbours are formed by five moles dividing the bay into four parts. The two western moles form the Imperial or Pratique port, and the two eastern moles the Quarantine port, the intervening space with its centre mole affording wharfage of about 1,500 yards.

An outer harbour has been formed by the prolongation of the eastern mole (Vorontzovski), a distance of about 700 yards in a north-east and north-west direction, forming an arch to the eastward, this portion is named the Reidovi mole ; also by a breakwater about 1,000 yards in length, named Volnolom, parallel to the shore, with a channel between its eastern extremity and Reidovi mole about 300 yards in width, and in which there is a depth of from 36 to 48 feet water. The channel between the western extremity of this breakwater and Pratique port moles, is about 500 yards in width. Volnolom breakwater forms a safe and commodious port protected from all winds.

Thirty-two mooring bollards are placed at equal distances along the harbour face of this breakwater, and there are several mooring buoys in the harbour for the convenience of shipping.

The Quarantine Port is formed by the Vorontzovski mole, 870 yards in length, arched to the north-west, and the Platonovski mole, 370 yards in length, which is curved towards the head of the former. The entrance is 260 yards in breadth, and the port is capable of containing 200 vessels ranged in tiers.

Every non-Russian vessel, even though not coming from a suspected

* Consular Report, part IV., May 1883.

place, is sent to this port, and special limits are assigned for those who have to undergo quarantine.

Telegrams are posted up daily both in the Quarantine and Pratique harbours of the state of the weather at the principal ports in the Black sea.

Pratique (Imperial) Port.—At the distance of half a mile north-westward of Platonovski pier, and beyond the grand staircase, which reaches from the summit of the cliff to the beach, and near a second ravine, lies the Richelevski mole, about 440 yards in length, forming with Androsovski mole, and its continuation at right angles named Potapovski mole, the Imperial port, used only by vessels in pratique. The entrance is between Potapovski and Richelevski moles, and is 63 yards in width.

The Middle harbour (between Quarantine and Pratique harbours) is being continually dredged, and vessels can now anchor throughout the space thus dredged, and load, protected by the new breakwater, all along the new quays between the two harbours. The ground reclaimed from the sea is being gradually filled in, and custom houses and warehouses for the foreign trade are to be built thereon.

LIGHTS.—A *fixed* white light varied by a *red* flash every *minute*, is exhibited from a gray lantern on a moveable iron framework, 30 feet high, on Vorontzovski mole, abreast the entrance to Quarantine harbour. The light is 44 feet in elevation and should be seen from a distance of 8 miles in clear weather. A yellow flag is hoisted by day.

At the outer extremity of Reidovi mole (the continuation of Vorontzovski mole) three *fixed red* lights are exhibited diagonally.

At Volnolom breakwater, two *green* lights, placed *vertically*, are exhibited from the eastern extremity, and two white lights, placed *vertically*, from the western.

A *fixed* white light is exhibited from an iron circular tower, painted white, on Richelevski mole (entrance to Pratique harbour); it is elevated 32 feet above the sea, and should be visible about 6 miles.

This light is reflected from the extremity of Potapovski mole at an elevation of 19 feet.

Docks.—There are three wet docks at Odessa.

Communication.—Vessels of the Russian Steam Navigation Company run between Odessa, Eupatoria, Sevastopol, Yalta, Theodosia, Kertch, Novorossisk, Soukhoum, Poti, and Batoum.

ODESSA BAY.—The bay of Odessa is extensive, and the depth of water quite sufficient for the largest ships, but it is more or less exposed to the two most dangerous winds that blow on the coast from the south and

S.E. They are uncommonly violent during the equinox, and are the chief cause of the havoc committed in the Black sea. The three great rivers, the Búg, Dniestr, and Danube, also bring large masses of water to the sea from opposite points of the compass; and if a south or S E. wind is blowing, produces the so-called *hacking* waves.

These dangerous winds do not frequently occur in the summer, for a northerly wind blows almost without intermission at that season. Though less injurious to the vessels, it is extremely unpleasant to the inhabitants of the town, since, especially during the hot days of July and August, it brings the dust from the parched plains and steppe, occasioning insufferable heat, which is only slightly diminished in the evening. Vessels lying in the bay should always keep their spare anchors ready to let go, as they may part in the heavy squalls.

The sandy plain of Peresip lies at the head of the bay, and is formed between two salt lakes, separated by some table land. A suburb of Odessa stands on the plain to the northward of the town; from thence the shore curves to the north-east, towards Dembrovskoi (east) point, which bears N.E. $4\frac{1}{2}$ miles from the Quarantine port. The greatest depth at the entrance of the bay is 8 fathoms, which gradually decreases to the shore, but vessels of light draught, in turning to windward should not stand towards Peresip beach into less water than $2\frac{1}{2}$ fathoms, which depth will be found at half a mile distant, and also take care to avoid the rocks and foul ground that extend to the southward of Dembrovskoi point.*

* See also Admiralty chart, Odessa to Sevastopol, No. 2,232; scale $m = 0.17$ inches.

CHAPTER III.

NORTHERN SHORE; FROM ODESSA TO KERTCH STRAIT.

VARIATION in 1884.

Kherson bay - - $2^{\circ} 45' W.$ | Sevastópol - - $2^{\circ} 30' W.$

DNIEPR ESTUARY.—Adjak Point.—From Dembrovski point the coast trends eastward for 22 miles, to Adjak point, on which stands the telegraph station and three beacons, forming a long bay, which has a depth of 5 fathoms varying at from one-half to $1\frac{1}{2}$ miles from the shore. The coast is of moderate height, steep, and of a reddish appearance, but a few lakes, separated from the sea by small bars of sand, break its uniformity.*

Ochákov Point, which forms, with the sandy promontory of Kinburn, the entrance to Kherson or Dniepr bay, bears E. $\frac{1}{2}$ S. 8 miles from Adjak point. On it are seen fort Nikolaev, and a small town bearing that name, also the ruins of the ancient Turkish fortress of Ozú, and on the summit the telegraph station.

Signals.—The depth of water in the channel of the Dniepr is shown by the International Code of Signals, from the signal mast on Ochákov heights, in feet and quarters of feet. Telegrams may be communicated by the same Code, to be paid for by the receivers.

Fog guns.—During thick or foggy weather, should a steam whistle, horn, bell, or other sound be heard, indicating the proximity of a vessel, three guns will be fired at intervals of three minutes, from Ochákov point.

Beacons.—On Ochákov heights near the western shore, are two beacons; the western, black, with ball on summit, in line with the signal staff leads eastward of shoal water off Berezan island; and the eastern beacon, black, surmounted by a chequered square, in line with the same signal staff leads northward of Kinburn spit.

* See Admiralty chart, Black sea, sheet 3; Odessa to Sevastópol, No. 2,232; scale, $m=0.17$ inches.

Lifeboat.—A rescue station with lifeboat is established at Ochákov point.

Berezan Island.—The coast between Adjak and Ochákov points recedes considerably to the northward, and the island of Berezan about half a mile in length from north to south, and a mile in circumference, may be seen, lying $2\frac{1}{4}$ miles to the eastward of Adjak point. Its shores are steep, and of a reddish tint, and from its south extreme a reef extends nearly half a mile south-eastward. A vessel cannot pass to the northward of this island, but she may make a long board in that direction when standing between it and Adjak point. There are from 20 to 14 feet water at about $1\frac{1}{4}$ miles from its eastern side, and good anchorage will be found at that distance to the westward of it.*

Buoy.—A red beacon buoy, with ball, placed in 18 feet water, marks the outer edge of the reef extending southward from Berezan island.

Odessa Sand Bank.—A long bank of sand, named the Odessa bank, extends to the westward from Kinburn spit, to within 9 miles of Odessa, with irregular depths of from 14 to 24 feet on it. Near the western extremity, and $9\frac{1}{4}$ miles E. $\frac{1}{4}$ N. from Odessa cathedral, is a patch of $3\frac{1}{2}$ fathoms, sand and shells, extending in a N.N.W. and S.S.E. direction about 400 yards. Eastward of this patch the water increases gradually, but to the westward it suddenly drops into 10 fathoms. The depths to the southward of the bank decrease gradually from 7 to $3\frac{1}{2}$ fathoms to the edge of the bank, but the channel to the westward, which is maintained by the united currents of the Dniepr and Búg, carries a depth of from 11 to 12 fathoms, and that to the northward from 10 to 5 fathoms, over a bottom of mud and shell.

BEREZAN LAKE.—LIGHTS.—The high light, Upper Victorovski, is a fixed *white* light, elevated 120 feet above the sea, and should be visible in clear weather from a distance of about 12 miles. The lighthouse is situated on the elevation westward of Berezan lake, about $1\frac{1}{10}$ th miles N.N.E. of the old upper lighthouse.

The low light, Lower Victorovski, is a fixed *red* light, elevated 97 feet above the sea, and should be visible in clear weather from a distance of about 8 miles. The lighthouse is situated on a bluff near the guard-house on the south-eastern side of Berezan lake, distant $2\frac{1}{2}$ miles S. $42\frac{1}{2}$ ° E. from the high lighthouse. These lights in line lead through Ochákov channel, eastward of Kinburn spit.

* See Admiralty plans:—Kherson bay, Berezan island to Búg river, No. 2,379; scale, $m = 1\cdot 5$ inches; and Dniepr and Kherson bays, No. 2,380; scale, $m = 0\cdot 6$ inches.

Beacons.—About half a mile north-eastward of Berezan point is a red beacon, elevated 54 feet above the sea, consisting of two upright masts with diagonal cross bars; and at the distance of 1,500 yards N. 39° W. of this beacon is a red stone pyramid at an elevation of 81 feet above the sea.

Directions.—Small craft of 6 feet draught can enter Berezan lake, by keeping the red beacons in line bearing N.W. $\frac{1}{2}$ N.; afterwards passing between the black buoy or the starboard hand and red buoy on the port.

KHERSON BAY.—LIGHTS.—The principal light to guide to the entrance of Kherson bay is that shown from Souronovski mound (Potemkin hill); it is a *fixed* white light, visible in its full brightness between the bearings of N. by E. $\frac{1}{2}$ E. and N.E. $\frac{1}{2}$ E., or within the limits of safe navigation for vessels drawing 15 feet of water. Nearer the shoals the light decreases in brightness. The light is exhibited from a white dwelling-house, elevated 146 feet above the sea, and visible in clear weather from a distance of 18 miles.*

The light Dneprovski Limanski, shown from fort Nicolaevski, about $1\frac{1}{2}$ miles S. by E. of Ochákov point, is a *fixed* white light through an arc of 7° , or between the bearings of S. 80° E. and S. 87° E.; it is elevated 11 feet above the sea, and should be visible in clear weather from a distance of about 4 miles.

In addition to this sector of 7° , there is shown from the same lighthouse, as a guide to vessels approaching from Ochákov and Dniepr bay, a *fixed* white light, visible through an arc of 180° , or between the bearings of N. by W. $\frac{1}{4}$ W. (through west) and S. by E. $\frac{1}{4}$ E.; it is elevated 11 feet above the sea, and should be visible in clear weather from a distance of about 4 miles.

On the north side of Kherson bay, near the telegraph at Ajighiol, are two light towers, placed E. by N. $\frac{1}{2}$ N., and W. by S. $\frac{1}{2}$ S. 1,380 yards from each other; the western shows a *fixed red* light at 112 feet elevation, the eastern a *fixed white* light at 170 feet; in line they lead up the channel after leaving the sector of Nicolaevski fort light; and are visible in clear weather from 12 to 15 miles.

LIGHT VESSEL.—A light vessel is placed off Ajighiol spit in 23 feet water, and exhibits at an elevation of 38 feet, a *fixed white* light, visible from 5 to 7 miles. A bell is sounded in foggy weather, which is rung continuously for *ten minutes*, followed by an interval of *five minutes* silence.

* See Admiralty plan of Kherson bay, No. 2,379; scale, $m = 1\cdot 5$ inches; and Dniepr and Kherson bays, No. 2,380; scale, $m = 0\cdot 6$ inches.

The light vessel is painted black, has three masts, and carries by day a chequered ball over a flag, at the mainmast head. The depth in the channel is shown from the mizenmast by the International Code of Signals.

Kinburn Point.—The southern coast of Kherson bay is low and sandy, and terminates to the westward at Kil-burùn or Kinburn point, which is low and narrow and subject to inundations. It lies W.S.W. about 2 miles from Ochákov point, and 2 miles N.N.W. $\frac{1}{2}$ W. from Kinburn fort.

Shoal.—Buoy.—A shoal or spit of 12 feet and less extends half a mile north-westward of Kinburn point, and 50 fathoms from the extremity is placed an automatic whistle buoy, painted black, which, in winter, is replaced by a black perch with flag.

Buoys and Beacons.—Black buoys and beacons mark the starboard side of all the channels, and red buoys and beacons the port side, coming from seaward.

On Nicolaevski fort two beacons are placed, which when in line, bearing E. $\frac{1}{2}$ S., mark the fairway from Ochákov channel. The western one is 58 feet high, painted red, and is surmounted by a reversed cone; the eastern beacon is 66 feet high, painted white, and surmounted by a ball.

Caution.—The depths in the outer part of Kinburn channel are irregular, varying from 5 to 10 fathoms, and decreasing to $2\frac{1}{2}$ fathoms in the inner part, through which a channel with a least depth of 23 feet is being dredged; the true depth is signalled from Ochákov and from the light vessel, but as constant changes are occurring, with alteration of buoys and beacons, these directions can only be accepted with due caution.

Ten posts have been erected between Ochákov point and Kinburn spit to mark the direction of the telegraph cable. Vessels are prohibited from anchorage in or near the line of these posts, also in the fairway of the Búg or Dniepr, and must when navigating or at anchor exhibit the regulation lights.

Directions.—In proceeding from off Odessa to Kherson bay northward of Odessa bank, steer east-north-eastward in from 8 to 10 fathoms, until Adjak telegraph bears E. $\frac{1}{2}$ N. The telegraph station may then be steered for, as the lead will give warning of an approach to danger, and when nearing Adjak point, Ochákov telegraph kept open south of Berezan island, will clear the shallows off that point. When abreast of Adjak point, an E. by S. course will lead to a good anchorage off Kinburn fort in 5 fathoms, about one mile from the spit.

In passing Berezan island, if the buoy marking the flat on the south side is not in position, Ochákov signal staff must be kept on with, or open to the eastward of the black beacon with ball on Ochákov point, bearing about E. by N. $\frac{1}{2}$ N. Ajighiol telegraph just open north of Nicolaev fort also clears it. Proceeding to Kherson bay, Ochákov signal staff seen between the beacon with ball, and beacon with square, on Ochákov point, leads westward of Kinburn spit; and when Victorovski beacons are nearly in line, course should be altered to bring them in line astern, which mark will lead through Ochákov channel, between Kinburn spit and the red beacons marking Ochákov bank.

When the two beacons on fort Nicolaevski are in one, they must be steered for until Ajighiol lighthouses are in line, which latter mark will lead through the channel until Ajighiol light vessel bears E. $\frac{1}{4}$ S., when that course will lead across the bar with a depth as shown by the light vessel.

By Night.—To enter Kherson bay by night, approach the Souro-novski light, within its arc of bright white light, and when Victorovski lights are in line, steer in keeping them in one astern, until the white sector of light from fort Nicolaevski is visible, when it must be steered for; then Ajighiol lights in line, will lead through the channel until Ajighiol light vessel bears E. $\frac{1}{4}$ S., when she must be steered for. As it may be presumed that pilotage is compulsory, night navigation should not be attempted when a pilot can be obtained.

RIVER DNIEPR.—The river Dniepr flows into Kherson bay by nine mouths, three of which are the principal, and form clusters of islands covered with reeds, which are mostly uninhabitable. The mouth of the Kysim, formerly the most navigable, is pointed out by Kysimka point, which has a reddish appearance, and gives its name to this branch. It has about 7 feet water in it.

The principal mouth, at present used by coasting vessels, is the Srednoë entrance, near the southern bank, about $2\frac{3}{4}$ miles to the southward of Kysimka point. There is about 10 feet of water at the entrance, which is subject to change; the channel is marked by buoys and beacons.

KHERSON.—This town stands on the right bank of the Dniepr, where it is half a mile in breadth and 30 to 40 feet deep. As the navigation of this river is difficult, and freights therefore are generally lower at Odessa, some of the produce is carried by coasters to Odessa from Kherson. Here was formerly a dockyard, of which only a ropeyard remains. The naval station has been removed to Nikoláev, and since

Odessa has been made a free port, the commerce of Kherson has much diminished. The river is frozen for about two months, from the middle of December to the middle of February. Sometimes a strong south wind will break up the ice during this interval, but with the returning wind from the northward it soon again becomes frozen over.

From off Ajighiol point, if bound for the Dniepr, steer E. by S. $\frac{1}{2}$ S., which will lead to the passage south of cape Stanislav, which is marked by a red beacon on the north, and a black beacon on the south bank; after passing between these, steer a little more southerly for the Srednoïe, the principal mouth of the Dniepr, but use great caution, for the depths are very uncertain above the cape.

RIVER BÚG.—The entrance to the river Búg, which throws its waters into Kherson bay, is between Ajighiol and Bublikov points, which bear East and West from each other, distant 11 miles. The river is from one to 3 miles in breadth, with a tortuous course, the shores and points being bordered with sand flats, especially on its eastern side, where in some places they extend out beyond the middle of the stream. The depths vary as far up as Nikoláev, from 20 to 60 feet.*

NIKOLÁEV (Nicolaieff).—The town of Nikoláev stands on the eastern bank of the river, at 20 miles from its mouth, and at the junction of the rivers Ingul and Búg. It is the Russian arsenal of the Black sea, where ships of war are built and launched into the Ingul, from which they pass into the Búg by a channel from 20 to 27 feet deep. Its population (1880) has since the revival of the arsenal and the opening of the railway risen to 66,000.

Time Ball.—From the observatory at Nikoláev, a black ball is dropped at noon, Nikoláev mean time, which corresponds to 21 h. 52 m. 4.9 sec. Greenwich mean time. The ball is hoisted close up at 5 minutes before signal; if signal fails, the ball, after an interval of one minute, is lowered very slowly.

Dock.—There is a depositing dock at Nikoláev, 280 feet long, 72 or 144 feet broad at entrance, with 20 to 22 feet over the blocks. This dock can take vessels of 400 feet or 200 feet in length.

Trade.—The navigation of this port, opened (in 1882) on 5th March, and was closed by ice on 17th December, though several steamers left earlier fearing to be frozen in. The number of vessels that cleared from the port with cargoes amounted to 153, representing a tonnage of 161,930

* See Admiralty plan of river Búg, No. 2,378; scale, $m = 1.5$ inches.

tons; 128 of these vessels were British, averaging 900 tons. The season being a bad one, this is much below the general average.

LIGHTS IN RIVER BÚG.—Russian Spit Light.—The first light in the river Búg is exhibited at Sviatotroitski from Russian spit (Kosá Russkaia) on the east bank. It is a *fixed* red light 55 feet in elevation, visible between the bearings N. $\frac{1}{4}$ W. and N. $\frac{3}{4}$ E., and may be seen in clear weather from a distance of 8 miles.

Voloisk Lights.—The next light is placed one mile above Voloisk spit on the west bank, and opposite Russian spit; it is a *fixed* white light, visible between the bearings of N.W. by W. $\frac{3}{4}$ W. and W. by N. $\frac{1}{4}$ N.; its height is 70 feet above high water, shown from the window of a house.

This house also exhibits a *fixed* white light, between the bearings of S. $\frac{1}{2}$ E. and S. $\frac{1}{2}$ W. The latter bearing leads one cable west of Arjinskai bank.

Sievers Point Light.—Farther up on the east bank, at Sievers point, are two leading lights; the upper one, N.E. $\frac{1}{8}$ E. 5,500 yards from the other, is a *fixed* red light, 187 feet in height, visible between the bearings of N. 39° E. and N. 55° E. and may be seen about 15 miles; the lower is a *fixed* white light, 30 feet in height, placed on the extremity of the point, and is visible about 7 miles, on and westward of the bearing N 47° E. The lights in line lead up the fairway of the river.

On the east bank, opposite fort Konstantine from the end of a pier, a *fixed* white light, 13 feet high, is shown, and which is visible 4 miles.

Fort Konstantine.—Light.—A harbour light is exhibited from a red perch, in 3 feet water, at the extremity of the spit extending off fort Konstantine. The light is *fixed red*, elevated 16 feet above the water, and should be visible 4 miles. The channel between this light and the light at the small port on the east bank of the river is 370 yards wide, and with a depth in mid-channel of about $5\frac{1}{2}$ fathoms.

Town Light.—Near the merchants pier, on the south side of the town of Nikoláev, is a *fixed red* light at 37 feet elevation; it is visible 7 miles.

Telegraph Cable Lights.—The shore ends of the telegraph cable at the junction of the Búg and Ingul rivers, are marked by red and yellow lights, on black and yellow beacons. Anchorage on the line of these marks is prohibited.

Buoys.—The shallows extending from the sides of the river Búg are marked by buoys and beacons, red on the west bank, black on the east.

Three red buoys are placed on the edge of the shoal off Sari Kamishi and Sarikalsk points, at half a mile from the shore; this bank is steep-to and cannot be approached by the lead; and this is the case with most of the shallows in this river. A red buoy marks the end of the Voloisk spit, and a black one the extreme of the Russian spit opposite; farther up, a black buoy and two black beacons show the edge of the shoals extending off Arjinskai spit, and a black buoy and a black beacon the prominent points of the shallows off Crooked and Balabanovka spits. Half a mile south-south-east of fort Konstantine a red buoy marks the projecting point of the shallow on which that fort is built; and beyond it a red buoy and a red beacon show its northern edge. Several black buoys and beacons are placed on the edge of the shallows off the low land on the south and west sides of the town of Nikoláev.

All the buoys of the Búg river are placed in 18 feet water.

DIRECTIONS.—It appears that in the ordinary condition of the Búg river, all vessels that can enter Kherson bay may reach the town of Nikoláev; the navigation is not difficult by day, as the shoals are sufficiently marked by buoys; nor at night, for the lights are continuous. After leaving the Ajighiol light vessel, steer E. by N., and on arriving opposite the red buoys off cape Sari Kamishi and Sarikalsk, the river will open out, the high land of cape Seminov on the eastern side of the entrance being then in view: from this point as far as Russian spit, the centre of the river is quite clear, and it is only necessary to avoid too close an approach to its sides, from which shallows extend in some places three-quarters of a mile. When off the village of Parutino the Voloiskia and Russian spits will be observed; pass between the buoys, marking the ends of the shallows off these, and then follow the curve of the west bank at half a mile distant, leaving the black buoys and beacons to starboard; this will take the vessel as far as Sievers spit, when by keeping over to the east bank, leaving the red buoy and fort Konstantine to port, she will arrive at the town of Nikoláev.

By night, the Russian spit light must be steered for within its arc of visibility, between the bearings of N. $\frac{1}{4}$ W. and N. $\frac{3}{4}$ E., until Voloiski light is seen, the latter light must then be approached on a W.N.W. bearing: on being assured of having passed the Russian spit buoy, or when the Russian spit light bears E.N.E., alter course to the north west, following the west bank at half a mile distance; the other light in Voloiskia house will soon come into view, and the vessel is to be kept within its limit sufficient distance from the west bank, observing that the eastern limit of visibility of this light S. $\frac{1}{2}$ W. passes very near the shoals off Arjinshai spit; continue this curving course until Sievers lights appear, these in line will

take the vessel close up to Sievers spit, the east bank is now to be followed, passing between fort Konstantine spit light (red), and the white light abreast of it, and anchoring southward of the red light at the town.

Ice.—About the beginning of December the rivers Búg and Dniepr with Kherson bay begin to freeze ; at this time the buoys are taken up, and the lights discontinued ; the navigation is not again open until the middle of March, when the buoys, marks, and lights are replaced.

Current.—In April and May will be found the deepest water and the strongest outward stream, caused by the melting of the snows ; it is said the current never exceeds 2 miles an hour. In the fall of the year it is but slight in Kherson bay, and uncertain in direction in the river Búg, where it is influenced by the prevailing wind.

Winds.—In the spring and summer, the winds blow from N.E. and S.W., sometimes very strong. In the autumn they are more variable ; high winds cause a confused sea in Kherson bay, but the effect in the river Búg is but slight.

Bottom.—In the deeper parts of Kherson bay and the Búg river, the bottom is soft mud ; except where cross sand ridges are forming. The shoals at the mouth of the Dniepr river are of hard sand.

KINBURN BAY.—The coast from Kinburn point continues low and sandy to the south-east for 12 miles ; it then bends in to the eastward, forming the spacious bay of Kinburn, which affords plenty of room for small vessels, in depths varying from 12 to 20 feet, over a bottom of mud and sand, and sheltered from N.W. and northerly winds. It is, however, but seldom visited. The entrance into the bay is about $4\frac{1}{2}$ miles in breadth, between the southernmost of the Dolgi islets, (which extend $3\frac{1}{2}$ miles south-eastward from the north point of the bay,) and its southern shore, but the channel is only $1\frac{1}{2}$ miles wide, with a depth of 2 and $2\frac{1}{2}$ fathoms. The usual anchorage is about 2 miles eastward of Dolghi island.*

TENDRA PENINSULA.—The long sandy plain already mentioned, which terminates to the westward of Kil-burùn or Kinburn point, is bordered to the southward by Tendra peninsula and Djarilgátskaia spit, two long strips of sand. The former is about 36 miles in length, and at its northern extremity about $1\frac{1}{2}$ miles in breadth, but as it trends to the eastward it gradually narrows to less than a quarter of a mile. Two narrow channels or breaks, of about a cable in breadth, separates its eastern end from the main land.

When from 25 to 30 miles southward of the peninsula, the shells brought

* See Admiralty plan of Tendra peninsula, No. 2,210 ; scale, $m = 0\cdot 3$ of an inch.

up in the arming of the lead are broken, perforated with holes, and full of mud, but this peculiarity changes as soon as a vessel has passed to the westward of the meridian of the lighthouse, where the bottom is composed of whole shells, embedded in clean sand. The above remarks may be useful to the seaman in thick weather, when the lead should be kept constantly going, as no dependence then can be placed on seeing the land, which is extremely low, and not visible sometimes in fine weather at more than 3 or 4 miles distance.

TENDRA LIGHT.—Three miles southward of Tendra point, and S. $\frac{1}{2}$ W. $13\frac{3}{4}$ miles from Kinburn fort stands Tendra lighthouse, a white building on the western side of the beach, 79 feet in height from the base to vane. It exhibits a *revolving* white light every minute at an elevation of 96 feet above the sea, which may be seen in clear weather 16 miles; a bell is sounded in foggy weather.

Beacons.—The land of the peninsula being very low, three beacons have been erected, about 63 feet in height. The first stands on its northern extremity, and has a head formed thus \wedge . The second stands about $8\frac{1}{2}$ miles south-east of the lighthouse and has a head like the letter \vee ; and the third is about $18\frac{1}{2}$ miles to the eastward of the second, with three cross bars.

TENDRA BAY.—There is good anchorage in Tendra bay to the eastward of the lighthouse, in about 5 fathoms, at $2\frac{1}{2}$ miles from the shore, well sheltered from the south and west, as far round as N.W. by N., but the bay is open to the N.N.W. The space formed to the eastward, between the eastern part of the peninsula and the main land, is very shallow, having only a depth of from 10 to $1\frac{1}{2}$ feet in it.

Anchorage.—If a vessel, when bound to Odessa, is caught with strong northerly winds, she may anchor to the southward of the peninsula, in any convenient depth, as the shore is clean. There are from 27 to 32 feet at from $1\frac{1}{2}$ to $3\frac{1}{2}$ miles from it, and from 7 to 9 fathoms at $1\frac{1}{2}$ to 2 miles to the westward of the lighthouse, over a bottom of sand and shells.

DJARILGÁTSKAIA SPIT.—The coast to the eastward of Tendra peninsula continues low, and runs in the same direction to the eastward for 14 miles, with some high buildings on it; from thence a long strip of low narrow land, called the Djarilgátskaia spit, extends in the same direction for 23 miles to Djarilgat point, forming with the main land, a deep bay to the westward, affording a capital anchorage for vessels seeking shelter from W. or S.W. winds. The western end of the spit is not more than a cable across, but its breadth gradually increases to the eastward, where in some places it is nearly 2 miles.

Beacons.—Two beacons, each 63 feet high, have been erected on Djarilgátskai spit, one on the extremity of the point, the other about $12\frac{1}{2}$ miles to the westward.

Directions.—A vessel in rounding Djarilgat point must be careful to avoid the shoal which extends from it a good mile to the north-eastward, and is the beginning of a flat, carrying a depth of from 7 to $1\frac{1}{2}$ feet, and which encircles the whole shores of the bay. The best anchorage is in the middle of the entrance, in $4\frac{1}{2}$ fathoms, over a muddy bottom, at about 3 miles to the northward of the point.

GULF of PEREKOP.—Karkinit Bay.—This gulf is formed between Djarilgátskaia spit and the north-west shores of the Krimea. It is about 40 miles wide at its entrance, and carries a depth of from 17 to 6 fathoms, but its inner part, Karkinit bay, is very shallow, with several shoal patches in it. Captain Spratt, who visited this bay in December 1854, says, “The result of our several soundings showed that the head of the bay, leading up to the isthmus of Perekop, is not even navigable for boats, and that even a moderate sized vessel cannot approach within 14 miles of it.”

Bank.—A bank nearly 5 miles in extent, north and south, the extremities of which are marked by beacons, lies in the fairway of Karkinit bay.

Bakalski Spit.—A black beacon 62 feet high, surmounted by a ball, has been placed on Sariboula point, the south point of Karkinit bay.

The KRIMEA in extent is about 178 miles from east to west, and 107 miles from north to south. Its figure is quadrilateral, the sides of which are respectively directed to the N.E., N.W., S.W., and S.E., and the angles to the cardinal points. From the eastern point, however, a peninsula stretches out between the sea of Azov and the Black sea, terminating on the shores of Kertch strait. On three sides the Krimea is enclosed by the Black sea; on the north-east it is washed by the sea of Azov. Its area may be about 8,600 square miles, and the neck of land at its northern extremity, by which it is connected with the continent, is about 20 miles in length, and 5 miles across at Perekop. Its north-eastern division is a steppe, and has neither tree nor hill, but its southern part presents a far different appearance, the mountains rising to a considerable height, and encircling valleys of great beauty and fertility.

Karamroun Point.—The north-western part of the Krimea is about 64 miles in length from Korkazák in Karkinit bay, to Karamroun point, and is formed of elevated plains, which may be seen at a good distance; its shores are bold and steep.

Akmechet Harbour.—The harbour of Akmechet (or white mosque) lies 12 miles N.E. by E. of Karamroun point, and is much frequented by vessels running between Odessa and the Krimen. It may be recognized by a high white tower on the western point of the entrance, which is about two-thirds of a mile wide, but is narrowed to half a mile by rocks bordering the points, and which must be given a berth of $1\frac{1}{2}$ cables. The harbour is about three-quarters of a mile in depth, and has a village on its southern shore, which, on entering, must be steered for on a S. by W. $\frac{1}{4}$ W. bearing.

Anchorage.—The best anchorage is about 3 cables N.E. by N. of the village, in about 5 fathoms, on a sandy bottom, midway between its two inner points, which are also bordered by rocks. Between the village and the inner point, on the western shore, on which stands the Quarantine office, the coast recedes a good half mile to the south-west, forming a cove, in which small vessels may anchor in from 3 to 2 fathoms sandy bottom, well sheltered from N.W. and North winds, which they would be exposed to in the harbour.*

CAPE TARKAN bears from Karamroun point S. $\frac{1}{2}$ E. 3 miles, and between them the coast falls back to the eastward, forming a little bay, open to the westward, at the head of which is the valley of Karaji. The bay is remarkable for its beach, trees, and village, abreast of which a vessel may anchor in $5\frac{1}{2}$ fathoms, over a bottom of mud and sand, taking care to avoid a sunken rock, not far from the shore, towards the middle of the beach. Protection is given to this anchorage from northerly winds by Karamroun point, and from those from the southward by a rocky bank which extends out nearly a mile to the westward from the low point of the cape, but it is open to the westward. There are 10 fathoms on this bank at half a mile from the shore, but it should not be approached, as it is dangerous.

CAPE TARKAN LIGHT.—A lighthouse has been erected on the south-west extremity of cape Tarkan, 110 feet in height, which exhibits a *fixed* light at 117 feet above the sea. It may be seen in clear weather at the distance of 12 miles. Vessels can communicate with the Telegraph station (by whom telegrams will be forwarded to be paid for by the receivers) by the International Code of Signals.

Fog Signal.—A steam fog siren, which during thick and foggy weather gives a loud blast of *two seconds* duration every *thirty seconds*, has been established 300 yards south-east of the lighthouse.

Near this cape are often experienced changes of wind, squalls, or sudden calms, when the current makes the sea short and broken. Off the cape, the wind generally hauls round to the N.E. during the night.

* See Admiralty plan of Akmechet harbour, No. 2,292; scale $m = 4\cdot 2$ inches.

Current.—In passing cape Tarkan, or the Gulf of Perekop, a strong current will be felt setting to the eastward with westerly winds, and to the westward with easterly winds, which must be carefully watched in order to profit by its variations.* If a vessel, on her way to Odessa, should meet with a continuance of westerly winds on this coast, she should at once make long boards, and endeavour to get over on the western shore, instead of trying to turn to windward along Tendra peninsula. A change takes place in the colour of the sea off cape Tarkan, from a bright blue to a dirty and dark green, and the tint gradually deepens as Odessa is approached.

Ouret Point.—From cape Tarkan the coast runs E.S.E, for 7 miles to Ouret point, where the shore forms an angle of white bold rocks. The point has shoal water off it, and the depth of 5 fathoms only will be found at nearly half a mile to the southward. There is anchorage to the eastward of the point in about $8\frac{1}{2}$ fathoms, over sand and mud, well sheltered from all northerly winds. The coast from Ouret point bends in to the eastward for 9 miles, and then trends to the south-east for 22 miles, to Eupatoria point, which is low, preserving a depth of 10 fathoms at $1\frac{1}{2}$ miles from the shore.

KALAMITA BAY.—Eupatoria point is low and sandy, and should be carefully approached, as the soundings shoal quickly from 7 fathoms to 16 or 18 feet. There is a depth of from 4 to 5 fathoms nearly one mile southward of the point.†

From Eupatoria point the coast again bends in to the eastward for 7 miles; it then trends to the southward for 22 miles, where it makes a short turn to the westward to cape Loukoul, thus forming the bay of Kalamita. The shore of the bay is clean, and a depth of 5 fathoms will be found at $1\frac{1}{2}$ miles from the coast, with the exception of the foul ground bordering Eupatoria point, and a shoal which extends a good mile from the coast a little to the southward of Staroe Oukreplenie (Old Fort), the point of disembarkation of the allied armies on the 14th September 1854.

EUPATORIA or KOSLOV stands on a low, flat, and sandy country in the northern bight of the bay. A little to the westward of the town the low point of the lazaretto projects to the south-eastward, and is bordered by a sand bank which extends $2\frac{1}{2}$ cables from the shore, where a depth of 3 fathoms will be found. This bank affords protection to small vessels, (from the sea which rolls in with a south-westerly wind,) in

* A current is reported to set in-shore with southerly and south-westerly winds at the rate of three-quarters of a knot per hour, and with north-easterly winds to set seaward, sometimes at the rate of $1\frac{1}{2}$ miles.—“Loss of the Russian Imperial Yacht *Livadia*.”

† See Admiralty chart:—Sevastopol to Kertch strait, No. 2,283; scale, m = 0.2 of an inch.

about 3 fathoms over a sandy bottom, at a quarter of a mile from the town, and to the South or S.S.E. of a church which stands near a large mosque, not far from the beach.

There are several windmills between the lazaretto and the town, and also between the town and the great salt lake, named Sasik, which covers a considerable extent of ground, to the south-eastward, and is separated from the sea by a narrow neck of land. To the south-eastward of the town may also be seen the summits of several mountains on the southern coast of the Krimea, the most remarkable being Chádir Dagh.

LIGHT.—A lighthouse is established on Eupatoria point, from which is exhibited at an elevation of 52 feet above the sea a *fixed* white light, with alternate *red* and *white* flashes *every minute*, and should be seen in clear weather a distance of 9 miles.

The tower of the lighthouse is about 45 feet high, surmounted by a red lantern, and stands on low sandy ground.

Fog Signal.—During thick or foggy weather, should a steam whistle, horn, bell, or other sound be heard indicating the proximity of a vessel, *three guns* will be fired at intervals of *three minutes*.

Lifeboat.—A lifeboat station has been established near the light-house.

Anchorage.—Large vessels lying in the roads moor east and west, over a mud bottom, with open hawse to the southward, they should not anchor farther to the N.E. than to have the mosque N.N.W. and Eupatoria lighthouse W. by S. $\frac{1}{2}$ S., in which position there is a depth of about 5 fathoms.*

This roadstead is dangerous during South, S.E., and S.W. winds, although the S.E. blow from the shore. With the mosque bearing N.N.W. there are 3 fathoms at half a mile from the shore. Coasters can approach near to the shore, and they even make fast to a wooden pier, where there are 7 and 8 feet water.

“ During the heavy gale of the 14th November 1854, the sea ran very high in the roadstead of Eupatoria, but those vessels anchored near the town experienced a current or undertow setting out of the bay, which although it caused them to labour greatly, and to ride broadside to the wind, yet it took great strain off their anchors and cables. The ships lying farther out and more to the southward did not feel this current, and several of them, including one French and one Turkish line of battle

* The combined fleets anchored here in 1854, previous to disembarking the troops on the south-east side of the bay; H.M.S. *Britannia* (flag ship) anchored in 12 fathoms, with the town of Eupatoria bearing N.N.E.

ship, and a French steamer, broke their chains and were thrown on the beach."*

Coast.—From Eupatoria the coast continues low for about 13 miles, and may be approached by the lead to 5 fathoms at nearly one mile distant, thence are some low red cliffs, and further southward a guard-house.

The coast continues low, with red cliffs as far south as the Alma, whence becomes higher with steep perpendicular cliffs and table land.

The mouth of the river Bulganak, 5 miles northward of cape Loukoul, is marked by a guard-house on the north side of a deep gully in the cliffs.

Shoal.—Nearly abreast of the guard-house in lat. $44^{\circ} 59'$ N. (nearly) is a shoal of 16 feet, about $1\frac{1}{2}$ or 2 miles from the shore, which was discovered by the French screw corvette *Primanguet*.†

Alma River.—The Alma river is situated 3 miles southward of Bulganak river, and 2 miles eastward of cape Loukoul. The soundings off it in a north-west direction are regular, with a bottom of mud under a loose surface of gravel and shells. On the heights over the south shore of the Alma was fought the memorable battle of 20th September 1854.

Cape Loukoul is the western point of the bay into which the Alma river falls. It forms a remarkable projection, being nearly perpendicular, of little elevation, and of a reddish tint; a flat extends a full mile off shore northward of the cape, and rocks nearly dry lie half a mile westward. This cape should not be rounded within the distance of one mile.

Peter the Great Rock.—About 3 miles southward of cape Loukoul and nearly 3 cables from the shore is Peter the Great rock, of less than 6 feet, and seaward of it at about 8 cables from the shore, there is only a depth of 5 fathoms.

Terrible Rock, of 2 fathoms, and 3 cables distant from the shore, is 3 miles southward of Peter the Great rock, and about $1\frac{1}{2}$ miles north of the Katcha river.

Coast.—From cape Loukoul to the Katcha river, the coast is one steep perpendicular reddish cliff with a table top, and at about three-quarters of a mile off shore the soundings are very irregular over a rocky bottom.

Katcha Anchorage.—There is good holding ground off the Katcha river in 12 fathoms, mud, with the mouth of the river, which is

* Remarks by Commander J. P. Luce, H.M.S. *Lynx*, December 1854.

† Remark Book of Mr. W. T. Mainprise, Master, H.M.S. *Britannia*, 1854.

not easily seen, but is near the centre of the beach, bearing E. $\frac{1}{2}$ S. distant one mile ; and cape Loukoul just shut in by the land southward of it, about N. by E.* Between this position and the river the soundings shoal gradually to the shore, and there is $4\frac{1}{2}$ fathoms at 2 cables distance from the beach.

Belbek River.—Between the Katcha and Belbek rivers, a distance of about 4 miles, the land presents much the same appearance as to the northward, except that the cliffs are more sloping. Off the Belbek, the approach to the beach is more regular and less rocky. The beach extends about three-quarters of a mile southward of the river, beyond which the coast again rises to steep cliffs as far south as the semaphore. A large church is conspicuous in the valley through which the Belbek runs, and mountains rise in triple rows to the eastward, the table-lands of their summits, with their white edges, giving them the appearance of fortifications ; the Chádir Dagh, or Tent mountain, towering above all to the height of 5,135 feet above the level of the sea.

SEVASTÓPOL.—This town, the great Russian arsenal in the Black sea, is situated on the south-western coast of the Crimea, at almost equal distances, (about 160 miles,) from Odessa, the mouths of the Danube, and Sinópe. It stands on the southern side of the great harbour, between an inlet to the eastward which forms the inner harbour, and the Quarantine bay to the westward. To the eastward of the inner harbour is the Careening bay. The harbour has a great depth in its inlets, in some of which the largest ships can lie close to the shore. On the northern shore the entrance is defended by fort Konstantine, Sévernaya or North fort, and several detached works.†

Population in 1880 was about 26,000.

HARBOUR.—The harbour of Sevastópol is open to the westward, and is nearly 4 miles in length, and about three-quarters of a mile wide at its broadest part. Its situation as a naval port is justly esteemed, and, indeed, Europe presents few harbours so completely suited to the necessities of a large fleet. It has a depth of from 10 to 6 fathoms in mid-channel, with

* H.M.S. *Britannia* (flag ship) anchored in this position, with several ships of the combined fleets in company. On 13th November 1854, owing to threatening appearance of the weather, shifted to $16\frac{1}{2}$ fathoms, at $1\frac{1}{2}$ miles from the shore, and succeeded in riding out the terrible gale of 14th November, in which many ships were stranded.

† Manthorpe Bey, the English Commodore of the Turkish flying squadron in 1878, states that Sevastópol is defended by huge earthworks, armed with 35-ton guns.

muddy bottom, to within three-quarters of a mile from its head, where it becomes more contracted and shallow.*

Docks.—There is a depositing (sectional) dock at Sevastópol 280 feet long, and 72 or 144 feet broad at entrance, with 20 or 22 feet over the blocks. This dock can take a vessel 400 feet long, and is stated to be equal to a weight of 6,000 tons.

The Russian Steam Navigation Company have constructed two patent slips, capable of taking vessels of 12 or 13 feet draught and from 1,000 to 1,500 tons burthen. They have also a large factory for repairing machinery.

Measured mile.—Six pairs of beacons have been erected in the harbour, for the purpose of testing speed. The front beacons are surmounted by white triangles with the point upwards, those farther inland, by white triangles with the point downwards.

LIGHTS.—In order to facilitate the passage into the harbour, two lighthouses have been built, 48 feet in height, on separate hills to the eastward, bearing E. $\frac{1}{2}$ S. and W. $\frac{1}{2}$ N. distant $1\frac{1}{4}$ miles from each other. The eastern lighthouse stands near the town of Inkermán, and shows a *fixed* white light at 612 feet above the sea, which may be seen in clear weather at the distance of 28 miles. The western lighthouse stands at the head of the harbour, near Mackenzie (Gorá) hill, and also carries a *fixed* white light at an elevation of 402 feet above the sea, which may be seen at 23 miles. The lights are both screened, so as to show only in the line of the course up the harbour, namely E. $\frac{1}{2}$ S.

Beacon.—A pyramid beacon, surmounted by horizontal cross bars has been placed between the two lighthouses, to serve as a day mark with the lower lighthouse, when vessels are so close in that the high light is hidden by the near hills.

Cape Konstantine, the north point of the entrance, may be recognized by a telegraph station, and the round fort of Konstantine with a triple row of casemated batteries, standing on a low point which the cape throws out 1,400 feet to the southward. The cape is fronted by a rocky shoal, extending half a mile W. by S., to the depth of 4 fathoms. One-quarter fathom water only will be found at 2 cables, and 5 fathoms at 5 cables, in that direction from the cape. A beacon with red flag, marks the edge of the shoal. A vessel must give the southern point of fort Konstantine a berth of one cable, at which distance there is a depth of 5 fathoms.

* See Admiralty plan of Belbek river to cape Khersonese, including Sevastópol harbour, No. 228; scale, m = 2.29 inches.

South Shore.—To the eastward of Quarantine bay, on the south side of entrance, the shoals on the southern shore of the harbour become more dangerous, and extend farther to the northward. A double point, to the eastward of the bay, is fronted by a reef, extending one cable in a north-west direction from the western point, and 2 cables north-eastward from the eastern point.

Point Alexander.—At the distance of $2\frac{1}{2}$ cables eastward of the double point is Alexander point, projecting farther to the northward, and forming, with fort Konstantine, the entrance of the harbour, barely half a mile wide, which is reduced to 3 cables in breadth, between the depths of 5 fathoms. There are only 4 fathoms at a cable to the northward of the point, and 8 fathoms at $1\frac{1}{4}$ cables.

Artillery Bay.—Three cables farther to the eastward, at the foot of a steep point, it is requisite to give the shore a berth of $1\frac{1}{2}$ cables, as the depth of 4 fathoms only will be found at that distance to the northward of the point. A vessel may, however, approach nearer this point in entering Artillery bay, which lies 4 cables to the eastward of point Alexander, and which has a depth of 6 fathoms at its entrance. This bay, as well as that to the eastward, is sheltered from northerly winds by the opposite shore, and 40 years ago it was 4 cables in length, and more than a cable broad, but it has gradually filled up, and will soon cease to be used by trading vessels, for which it was intended. Vessels at anchor in it during N.W. or West winds suffer much from the ground swell, which often causes serious damage. A portion of the town of Sevastópol stands at the head of the bay.

Nikolas Point.—The rising ground of white rock, which forms the promontory on which Sevastópol is built, is 240 feet in height, and separates Artillery bay from the inner harbour. Nikolas point, its low extremity, is bordered by a dangerous reef, extending half a cable from the shore, which must be carefully avoided, and a berth of a cable given to it. The extremity is marked by a buoy.

Inner Harbour.—To the eastward of point Nikolas lies the inner harbour, between two steep hills, by which it is commanded. This safe anchorage is about $1\frac{1}{2}$ miles in length from north to south, and 2 cables wide at its entrance, which is formed by Nicholas and Paul points. It carries a depth of 6 to 9 fathoms, and its shores are steep-to.

Paul Point.—The eastern point of the entrance is fringed with rocks; from thence the shore runs a mile to the eastward, to the entrance of the Kilinbánochnaya or Careening bay, which has a depth of 5 fathoms in it.

LIGHT.—A lighthouse, circular, white, 113 feet high, stands upon the extremity of the cape, at only a few feet above the sea level, forming a conspicuous mark by day; it exhibits at an elevation of 116 feet, a white light *revolving* every ~~minute~~, and visible 12 miles. A telegraph station is established here, and telegrams communicated by the International Code will be forwarded, being paid for by those to whom they are addressed. There is good anchorage to the southward of the lighthouse with East, N.E., and North winds.

Directions.—A vessel in rounding cape Khersonese from the southward should keep Feolent point, a high perpendicular cliff, open of Cossack point, a nearer and lower bluff, until the lighthouse on the cape bears E. by S. $\frac{3}{4}$ S., or fort Konstantine is seen well open of the north coast of the peninsula. Then a N.E. by E. $\frac{1}{2}$ E. course will round the cape and all the shoal water off the points, none of the rocky ledges, (which it is difficult to know the position of, on account of the uniform appearance of the coast,) extending more than $2\frac{1}{2}$ cables off shore. As a general rule the points on the north side of the Khersonese peninsula should not be approached nearer than that distance.

FEOLENT POINT.—From cape Khersonese the coast is steep-to, and trends to the south-east for 7 miles, to Feolent point, which is a high perpendicular cliff, with a sharp conical rock rising from the water on its south-east side. The extremity of the point is only a few feet above the level of the sea. A reef extends off nearly $1\frac{1}{2}$ cables from the point.*

Anchorage.—From Feolent point the coast becomes more elevated, and bends to the eastward, forming a small bay, where the shore is clean and the water deep. Vessels are sometimes induced to anchor there in N.W. or W.N.W. winds, in about 25 fathoms water, to the southward of the monastery of St. George, which stands at half a mile to the eastward of the point.

“A patch of sand with 7 to 12 fathoms on it lies at the foot of a sort of landslip about a cable eastward of the monastery of St. George. H.M.S. *Lynx* anchored in 12 fathoms about a cable from the beach, well sheltered during a heavy gale from the N.E. on 28th October. This anchorage may be of service to a steam vessel when waiting under the land, until a northerly or north-easterly gale moderates sufficiently to allow her to round cape Khersonese.”†

Coast.—Coming from the south-westward towards Sevastópol, the land is very remarkable, forming three capes or headlands. The southernmost,

* See Admiralty chart:—Odessa to Sevastópol, No. 2,332; scale, m = 0.17 inches.

† Remarks by Commander J. P. Luce, H.M.S. *Lynx*, December 1854.

cape Aia, makes as a very high bold bluff, looking very much like the North Foreland, but much higher. The next to the northward, Feolent point, is moderately high, with three notches like steps in it, and between these headlands lies the port of Balaklava. The northernmost, cape Khersonese, is long and low, and will be readily known by the lighthouse on it.

BALAKLAVA.—The entrance to Balaklava harbour, which is not easily distinguished, lies about $4\frac{1}{2}$ miles to the eastward of Feolent point ; and an old Genoese tower stands on the eastern point of entrance. The port, which is exceedingly picturesque, is enclosed by steep and rocky hills, of a reddish colour, and is about three-quarters of a mile in depth, including its windings from north to south, and only 120 yards in breadth at its narrowest part ; but nearly a fourth of it is filled up with a muddy flat, which has been carried into the head of the port by a rivulet running through a valley to the northward. It has a depth of from 15 to 24 fathoms in the channel at its entrance with a gravel bottom, 6 to 8 fathoms in its narrow part, 7 fathoms abreast of the town, and 3 fathoms at nearly 2 cables from the head of the port, over a muddy bottom, where the mud flat before mentioned has only from 6 to $1\frac{1}{2}$ feet on it. A small islet, bordered by rocks, lies 2 cables from the head of the harbour, at about 70 yards from the western shore. The town stands on its eastern shore, and the inhabitants are principally engaged in the fishing and coasting trade.*

A vessel about to enter the harbour should steer for the ruined towers on the eastern point, and on a near approach, the entrance, which is about $1\frac{1}{2}$ cables wide, and bordered by steep rocks, will open out to port. Before entering, a boat is generally sent to make a hawser fast to the rocks at the western point of the entrance, and which should be neared under easy sail, taking care to avoid the sunken rocks which lie close to the southward of it.

Having entered, and steering N, by W., keep the western shore aboard, so as to have more room in case the wind should fail. At the first turning of the passage, a few houses of the town will open out to the eastward, at the foot of a narrow ravine, when haul to the E.N.E. and N.E. as far as the second turning, which is the narrow part, and not more than 120 yards from shore to shore, and only half that breadth between the depth of 5 fathoms. The harbour from thence runs to the northward, the widest part being abreast of the town, where it is about $1\frac{1}{2}$ cables from shore to shore.

If on entering the harbour the eastern shore is kept aboard, give the

* See Admiralty plan of Balaklava, No. 2,340 ; scale, m = 11.2 inches.

point on which stands the ruined tower a berth of a quarter of a cable, as there are not more than 3 fathoms at half that distance from the shore. On rounding the point to the eastward proceed as before, as nothing is to be feared from this passage, the shores of which are steep and rugged, and make it appear more formidable than it really is.

Balaklava Rock is $1\frac{1}{2}$ miles south-eastward of the entrance to Balaklava harbour, and $2\frac{3}{4}$ cables off shore; it has 11 feet on it, and is marked by a black buoy; 7 to 11 fathoms are found near.

The rock bears S. 20° W. from a white mark in a black cliff point in the curve of the bay.

Outer Anchorage.—As a general rule outside Balaklava, good holding ground is not found in less than 25 fathoms, in which and in deeper water the bottom is a tenacious sand. Vessels sometimes anchor near the Balaklava rock for shallower water; in doing so, keep the white streak in the cliff from N.E. by E. to East to avoid the rock. The highest round hill over the west side of the port, kept open to the southward of the south-west point of the entrance, bearing N.W., leads to the southward of the rock.

CAPE AIA.—The coast from the entrance of Balaklava, curves to the southward, its appearance being that of a long wall of gigantic rocks about 1,500 feet in height, with a flat and wooded surface, the perpendicular extremity of which is cape Aia, which bears S.E. $\frac{3}{4}$ E. 8 miles from Feolent point, and is remarkable for its height, steepness, and reddish appearance.

When to the north-westward of Sevastópol, cape Aia is to be seen over the intervening low land.

Anchorage.—Vessels sometimes anchor in the bend of the coast at about 2 miles S.E. of Balaklava, and they may also shelter themselves under cape Aia during violent easterly winds, where it will be quite calm, but they will be drifted to the westward by the current, and sudden squalls sometimes come down through the narrow openings of the mountains near Balaklava.

Saritch Point, the most southern projection of the Crimea, is of moderate height, and bordered by bold and pointed rocks and a rocky bank of sunken rocks, extending $1\frac{1}{2}$ cables to the southward, where lies a rock about the size of a boat, named Chubán Kayá (Shepherd's stone by the Tartars, which is often passed unnoticed, while at other times assumes the appearance of a formidable projection. Between cape Aia, and the stone, the coast bends in to the eastward, and forms the little bay of Laspynskaa Boukta, at the foot of some high mountains, which affords a good anchorage sheltered from West, round by north to S.E.

The most sheltered anchorage is about $2\frac{1}{2}$ cables from the shore, in 10 fathoms, abreast of the small headland on the southern shore, on which stands a white house belonging to the coastguard. Coasters loading at this place approach nearer the shore at the head of the bay, and moor in about 4 fathoms over a muddy bottom, which shelves very much from the shore. It is said, that at this anchorage the westerly winds seldom blow home; however, those from S.S.W. are generally considered dangerous, and a coaster must have good strong hawsers made fast to the shore to secure her against the strong north-easters which sweep down the hills with great violence. The coast from Laspynskaa Boukta to Saritch point is safe to approach, and at Kapkane a clear spring of water is found near the shore.*

SOUTH COAST.—The southern coast of the Crimea forms two portions of almost two equal arches, the one projecting to the southward, between cape Khersonese and cape Ayú Dagh, the other receding to the northward, between the latter and cape Meganom. The first, from cape Khersonese to Yalta, is backed by table lands of bold rocks, almost washed by the sea; the second by mountains of less uniform height, their bases being removed farther from the water's edge. The whole coast to the eastward of Saritch point to cape Aitodor is bold to approach, with several little inlets, which afford shelter for coasters with westerly winds, and in the fine season they are protected from those blowing at sea by the mountains on the coast. A depth of 9 fathoms will be found at a cable from the shore, and 22 fathoms at two-thirds of a mile distant. A vessel, however, must be on her guard against the sudden squalls to which some parts of this coast are subject.

CAPE KIRKIN, which bears East 10 miles from Saritch point, is a low and rocky projection, only recognized when running close to the coast. It is bordered by a few rocks, but they lie close to the shore.

From cape Kirkin the coast trends E. by N. $\frac{1}{2}$ N. for about $6\frac{1}{2}$ miles to cape Aitodor, which may be recognized by its lighthouse, and forms a projection between them, called Ilmen point, lying $2\frac{1}{4}$ miles from cape Kirkin. Between cape Kirkin and Ilmen point several large rocks point out the anchorage near the village of Semeis (Simfis) where vessels lie sheltered from westerly winds, in about 3 fathoms, very near the shore, abreast of a beach on which are some houses and stores. About $1\frac{1}{2}$ miles to the eastward of Ilmen point, the village of Aloupka comes in view, standing at the base of the angle of Ai Petros, or mount St. Peter, a steep flat rocky hill, 4,000 feet high, which turns suddenly to the northward. The village may be easily recognized by a Moorish castle, built of greystone, a church

* See Admiralty chart:—Sevastópol to Kertch strait, No. 2,233; scale, $m=0\cdot2$ inch.

having the appearance of a Greek temple, a pretty mosque, and other buildings surrounded with trees. Aloupka is an estate belonging to Prince Woronoff, much frequented by visitors. On the heights between Aloupka and cape Aitodor, and near mount St. Peter, are several beautiful dwelling houses, and at the seaside an estate, named Miskhor. Small vessels can anchor between this estate and cape Aitodor in a little cove, in 4 fathoms, about three-quarters of a cable from the shore, abreast of the last trees in the Miskhor garden, and sheltered from the westward.

CAPE AITODOR (St. Theodore of the Greeks) is the round extremity of a long, slightly-inclined tract of land, bordered by limestone rocks, 311 feet in height; it is bold to approach.

LIGHT.—A lighthouse, 38 feet high, painted white, exhibiting a *fixed* white light of the first order, at 315 feet above the sea, stands on this cape; it may be seen in clear weather 20 miles between the bearings of E.N.E., through north to S.W. $\frac{3}{4}$ S.

YALTA.—From cape Aitodor the coast trends N.E. by N. for $4\frac{1}{2}$ miles, to the small town of Yalta, it then turns to the eastward for about 4 miles to Nikitin point, which bears N.E. $\frac{1}{2}$ E. from the cape, distant $7\frac{1}{2}$ miles, forming between them an anchorage named Yalta road.*

The town of Yalta stands at the entrance of a beautiful valley, in proximity to the finest scenery on the coast, and its white houses and churches may be recognized a long distance at sea. Between cape Aitodor and the town may also be seen the magnificent Imperial palace of Orianda, situated on a low part of the shore, with high cliffs and tall trees overshadowing it; and also the estate and palace of Livadia, the property of the Empress of Russia, situated about 3 miles from Yalta. The Empress has also a smaller palace, named Eriklik, on the summit of mount Megabi, reached by a road either from Livadia or Yalta.

The population of Yalta in 1875 was about 2,000, largely increased in the summer season by visitors, which bids fair to make Yalta the Russian Brighton.

Steamers call twice a week, both up and down the coast.

LIGHT.—On Kilisi point, a *fixed red* light, visible between the bearings of N.E. by N., through north to West, is exhibited from a staff, at an elevation of 45 feet above the sea, visible in clear weather about 8 miles.

Lifeboat.—A lifeboat station has been established at Yalta.

Fog Signal.—During thick or foggy weather, should a steam whistle,

* See Admiralty plan of Yalta and Ourzouf roads, No. 2,211; scale, 1 m = 1 inch.

horn, bell, or other sound be heard at Yalta, indicating the proximity of a vessel, *three guns* will be fired at intervals of *three minutes*.

Bank.—From cape Aitodor the shore is bold to approach till abreast of Pototska, but from thence commences a bank of sand, which fronts the town of Yalta, and the extensive beach to the westward of it, and also borders the coast to the eastward. Its outer edge, in 5 fathoms, is about $4\frac{1}{2}$ cables to the southward of a rivulet, which furnishes excellent water, and runs into the sea a little to the westward of the town, but a depth of only $2\frac{1}{2}$ fathoms will be found on it 2 cables to the southward of Kilisi point.

Yalta Road is frequented by vessels which meet with north-easterly winds when bound to Theodosia or Kertch strait.*

It is open from East to S.S.W., but although the winds from seaward rarely blow with any strength, yet the sea often rolls in with great violence, and vessels have been wrecked during the autumn months. It sometimes blows hard from the N.W.

The anchorage is about half a mile S.E. by S. of the town, in 10 fathoms, over sand and mud; but small vessels anchor abreast of the town, about half a cable from the beach, in 3 fathoms, with the church which stands above the town bearing N. by E., or to the southward of the stone bridge crossing the rivulet. The Tartars haul their vessels up on the beach.

Ourzouf.—Nikitin point, 4 miles eastward of Yalta, is fringed by rocks, which extend three-quarters of a cable from the shore; thence the coast takes a northerly direction for $2\frac{1}{2}$ miles to the village of Ourzouf, and then curves 3 miles to the eastward to cape Ayú Dagh, forming in the bend of the coast the road of Ourzouf. The houses of the village stand one above the other in the form of terraces, near the rock on the seashore, on which are the remains of walls.

The Anchorage in the road is in about 7 fathoms, over sand and mud, at half a mile S.S.E. of the village. There is good anchorage at a quarter of a mile from the shore, in about 6 and 7 fathoms water, between the village and two rocks, 170 feet in height, which lie three-quarters of a mile to the eastward of it, and at 3 cables to the southward of a white point. The rocks are bold-to, having a depth of $5\frac{1}{2}$ fathoms in the channel between them, and $4\frac{1}{4}$ fathoms between the inner one and the white point. Between these rocks and cape Ayú Dagh the shore bends in to the northward, forming a cove, called Kiziltash, which is safe and deep. A vessel loading here with granite for the works of Sevastópol suffered no injury from a S.W. wind, when it was blowing hard in the offing.

* See Admiralty plan of Yalta and Ourzouf roads, No. 2,211; scale, $m=1$ inch.

CAPE AYÚ DAGH (Bear mountain), although much lower than the other mountains on the coast, is still remarkable both from its form and colour. Seen from the sea, its appearance is that of an island with a round surface, but when close in shore, and approaching it either from the eastward or westward, it is easy to perceive the form from which it has derived its name—namely, that of a bear lying down. The Greek islanders of the Archipelago call it the Camilla (Camel); it is probably the Kriumetópon or Ram-face of the ancients. Its summit, which rises about 1,800 feet, is covered with trees, and its perpendicular shores may be approached without danger, the water being deep all round. The usual westerly current is felt at its greatest force near this cape.*

Lampad Point.—From cape Ayú Dagh the coast trends N.N.E. for $2\frac{3}{4}$ miles to Lampad point, which is a bluff projecting to the eastward, rising in a conical form to 200 feet above the sea. It is bordered by rocks, some of which are visible, and must be given a berth of more than a cable. The coast between forms a bay, in which are the villages of Partenitsa and Kuchuk Lambat; the former lies $1\frac{1}{2}$ miles to the northward of the cape, and has a beach sheltered from the West and S.W., with a brook flowing through it. Kuchuk Lambat stands in the bend of the coast formed by Lampad point projecting to the south-east, and is remarkable for its pretty houses. The roadstead abreast of this village is in great repute amongst the native coasters.

Anchorage.—Vessels generally anchor in from 10 to 12 fathoms at 2 or 3 cables from the shore, but small vessels may anchor close in, with their anchors laid out to the S.E. and S.W., and their sterns secured with hawsers to the rocks bordering Lampad point to the westward, which forms a kind of jetty, sheltering them from the E.S.E., but they are exposed to all winds between S.E. and S.S.W. The S.W. wind often blows with violence through an opening formed by the Ayú Dagh and the other mountains.

Aloushta Anchorage.—Between cape Ayú Dagh and cape Meganom, which bear from each other E.N.E. and W.S.W. 34 miles, forming that portion of the southern coast of the Crimea which recedes to the northward, the shore is clean and safe to approach. About 5 miles to the northward of Lampad point is the village of Aloushta, which stands at the entrance of an extensive valley, at the bottom of which rises mount Tchadir Dagh (Tent mountain), to the height of 5,135 feet above the sea, at 6 miles from the coast.

* See Admiralty chart:—Sevastópol to Kertch strait, No. 2,233; scale, $m=0\cdot2$ inch.

This mountain, the highest in the Krimea, is remarkable by its form, and from its being insulated from the chain of mountains which it overtops. The anchorage is abreast of Aloushta fort, which stands near the village, at half a mile from the shore, in about 12 fathoms over a muddy bottom, but this roadstead is open to all winds from E.N.E. round by South to S.S.W.*

Coast.—Roads.—At 5, 7, 8, 13, and 19 miles, respectively, to the N.E. of Aloushta, are the open roadsteads of Miliya-ouzen, Sierrpata, Kourouk-ouzen, Tugak, Uskout, and Khanskär, which are more or less exposed to winds between East through south to S.W. ; the bottom, however, affords good holding ground. At 3 miles to the westward of Khanskär, the coast forms a little projection named Choban Kalessi, on which stands a ruined tower.

Soudak Bay.—About 7 miles to the eastward of Choban Kalessi are two other projections, named Chiken and Koba points, and from thence the coast recedes to the northward, forming, between the latter point and cape Meganom, a large bight, named Soudak bay, which is divided into three parts. The first division to the westward extends as far as the rock, on which are the towers of the ancient Soldaya ; it is bounded by woody mountains, and several buildings are about it. The anchorage is in 9 fathoms, over a muddy bottom, and there are 6 and 7 fathoms at a cable from the shore, but it is open from E.S.E. to S. by E.

The second part of the bay is bordered by a long and wide beach to the eastward of the steep rock on which stands the fortress of Soudak, at the entrance of a deep valley. The anchorage is in 10 fathoms, over a muddy bottom, about half a mile from the shore, with cape Meganom bearing E.S.E., and Koba point W.S.W. This is preferable to any other berth in the bight, as it is a good position from which to get under way.

The third division is between Alar (Altchan) point and cape Meganom, and is but little known, for vessels seldom anchor in it, although sheltered from W. by S. round by north to S.S.E. A depth of 10 fathoms will be found a little distance from the shore.

CAPE MEGANOM.—The mountain that forms cape Meganom is of moderate height, but it may be recognized at a distance from seaward, on account of its projection to the southward. It is arid and even, and its sides form three angles. The coast all round is bold to approach, with a depth of 15 to 20 fathoms at half a mile from the shore.

After rounding cape Meganom, the last great rocks of the Krimea will be seen to the north-eastward, named Kara Dagh (Black mountain), beyond

* See Admiralty plan of Aloushta, on plans of Russian ports, &c., No. 2.221 ; scale, $m = 1 \cdot 2$ inches.

which the country is more level. The cape is high, with an irregular surface of rocks resembling towers, and with a considerable depth around it. At its foot, to the westward, lies the village of Otouz.

From Kara Dagh the coast again trends to the northward for 3 miles, and then runs to the eastward for nearly 6 miles to Kiatlama point, forming the picturesque little bay of Koktebel at the foot of the valley of that name. It affords excellent anchorage, but it lies open to the South and S.E. The eastern side of the bay is formed by a narrow point projecting half a mile to the southward, to the eastward of which, at a little distance from the shore, will be seen two white rocks, like boats under sail.

KIATLAMA POINT (Stag's leap) projects to the south-east, and its extremity is formed by a little hill with steep sides, which being united to the coast by a low isthmus, gives it the appearance of an island when seen at any distance. A small portion of rock, detached as it were from its north-east extremity, has the appearance of an inaccessible islet, its separation from the point being about the breadth of a stag's leap. The point is steep-to, and bold to approach.

Tekiyeh Bay.—Anchorage.—From Kiatlama point, the coast falls back 2 miles to the westward, forming the bay of Tekiyeh, called by the Italians, Porto Genovese. It is open from N.E. round by east to S.S.E., and has a depth of from 7 to 14 fathoms with a mud bottom, at a quarter to three-quarters of a mile from the shore, which is bordered in some places by little ridges of rock lying close to the coast.

A little cove, which narrows the isthmus, is formed about three-quarters of a mile to the westward of Kiatlama point. It is about half of a mile wide, and a third of a mile deep, and has from 6 to 7 fathoms at its entrance, over sand and mud and 3 to 4 fathoms at less than a cable from the shore. The N.E. wind blows right into it.

Theodosia Point bears from Kiatlama point about N.N.E. $\frac{1}{2}$ E. $3\frac{3}{4}$ miles. Some rocks border the point, but a depth of 4 fathoms will be found at three-quarters of a cable, and 10 fathoms at a quarter of a mile to the eastward of it. A small white monastery, dedicated to St. Elias, stands at two-thirds of a mile to the westward of the point, and may be recognized from a long distance.

Fog Signal.—During thick or foggy weather, should a steam whistle, horn, bell, or other sound be heard at Theodosia point, indicating the proximity of a vessel, *three guns* will be fired at intervals of *three minutes*.

KAFFA BAY.—Theodosia point is the south-western extremity of the deep semicircular bay of Kaffa, formed between that point and

cape Chaouda (Tash Kyryk), which lies 17 miles to the eastward, by the coast receding nearly 8 miles to the northward. It has the very convenient depth of from 10 to 15 fathoms all over it, and 5 fathoms within $1\frac{1}{4}$ miles of its shores, which are safe and clean to approach, with the exception of a small rock which lies in the north part of the bay about three-quarters of a mile from the shore, abreast of the village of Siz Aoul.

After passing Theodosia point, and the low south point of the road named by the Russians Dvúkh-yakornoi (two anchors), to which a berth should be given of $1\frac{1}{2}$ cables, a vessel with a southerly wind should immediately haul up for the anchorage, as it often precipitates itself with violence from the mountains above the town.

KAFFA.—The town of Kaffa or Theodosia, formerly the largest and most important in the Crimea, stands at the western side of the bay; the shore from thence is low and sandy, but as it trends to the eastward it becomes more elevated, with steep sides of a reddish tint.*

Kaffa is a fashionable watering place with a population of about 10,000.

The roadstead abreast of the town is considered very good, being sheltered from all winds, except those from East and E.S.E. These send in a heavy swell, which, however, is attended with but little danger, as not a single case of shipwreck has ever been recorded. It is the best commercial port in Southern Russia, possessing the advantage of having excellent holding ground, and of never being frozen in winter, but since it has been despoiled of its privileges and revenues, it is but rarely entered save by a few vessels laden with the produce of the steppe, which is very fertile.

The usual anchorage for vessels in pratique is abreast of the eastern portion of the town, at about 4 cables from the shore, in 5 fathoms water, over stiff mud. The depths from thence decrease gradually to 2 fathoms, at the extremity of the quay, where small vessels are sheltered from the easterly winds by the storehouses.

Dvúkh-yakornoi point lies a little distance to the eastward of the first buildings of the lazaretto, which encloses some of the walls and several towers which are still standing of the ancient Kaffa of the Genoese.

The Quarantine anchorage is abreast of another projection to the westward of Dvúkh-yakornoi point, on which stands a long row of storehouses. Vessels anchor in 3 fathoms water at three-quarters of a cable from the shore; there are 4 fathoms at the distance of 2 cables.

A life-saving apparatus with signal gun is established at Kaffa.

* See Admiralty plan of Kaffa, on plans of Russian ports, &c., No. 2,211; scale m = 1·2 inches.

Cape Chaouda (Tash Kyryk) of the Tartars and Chiavetta of the Italians, is bordered on its western side by some rocks lying close to the shore. In approaching it from the westward, it may be recognized by a round hill called mount Diourmen, which appears connected with it, although lying 5 miles to the eastward. A Tartar village, named Karangout, stands near the mount. To the southward of mount Diourmen the coast projects in that direction, and forms the little point of Diourmen, which bears due east about 5 miles from cape Chaouda.

Anchorage.—There is anchorage in a small inlet to the eastward of Chaouda point in 4 fathoms, over mud and sand, about half a mile from the shore, sheltered from the W.S.W. round by the north to East. From thence the coast again recedes to the northward, and then trends eastward to mount Opouk, which bears from cape Diourmen E. $\frac{1}{4}$ N. 11 miles.

MOUNT OPOUK, which rises to a considerable height, may be seen at a great distance, and is sometimes compared to Gibraltar, although it is much lower. Its summit is flat, and covered with rocky projections, which have the appearance of fortifications. Mount Opouk can be rounded very close, and between it and Ilchan Kai rocks there is a depth of from 5 to 7 fathoms. The current here runs strong to the south-westward.

Ilchan Kai or Karavy Rocks.—The three rocks named Ilchan or Karavy, lie off shore about 2 miles W.S.W. of the mount, and when seen from the southward, appear like two vessels and a boat under sail. They are bold close-to, and a vessel may anchor near them, in about 9 fathoms water, with a mud bottom, when waiting for a favourable wind to enter the strait of Kertch. The *green* sector of Kyz Aül light visible between the bearings of N.E. by E. $\frac{1}{2}$ E. and E. by N. $\frac{3}{4}$ N. covers the rocks, and the *white* light in sight, leads southward of them.*

Anchorage.—From mount Opouk the coast again trends to the northward and eastward for the distance of 6 miles to Kyz Aül point. A vessel will find anchorage in the bend of the coast to the eastward of the mount in from 5 to 6 fathoms water, sheltered from W.S.W. round by the north to E. by N.

KYZ (KOUZ) AÜL POINT.—LIGHT.—The lighthouse 79 feet high, or Kyz Aül point is painted black and white in vertical stripes, and from it at an elevation of 203 feet above high water, is exhibited a fixed *white* and *green* light of the first order, which should be visible in clear weather a distance of 20 miles.

* See Admiralty plan of Kertch strait, No. 2,205; scale, m = 0.35 of an inch.

The light shows *white* between the bearings of West through north to N.E. by E. $\frac{1}{2}$ E.; and *green* from N.E. by E. $\frac{1}{2}$ E. to E. by N. $\frac{3}{4}$ N.; also between West and W. by S. $\frac{3}{4}$ S. The sector of *green* light seen from the westward, covers Ilchan Kai rocks, and that seen from the eastward covers Kishla reef and Highflyer rock. When nearing Kyz Aùl point from the westward, vessels must keep within the limit of the white light. When entering or leaving Kertch strait, St. Paul light should be kept in sight when crossing the eastern green sector of Kyz Aùl light, to clear the dangers off cape Takly and Kishla point.

Telegrams communicated by the International Code will be forwarded, payment being made by those to whom they are addressed.

Fog Signal.—During thick or foggy weather, should a steam whistle, horn, bell, or other sound be heard at the lighthouse, indicating the proximity of a vessel, *three guns* will be fired at intervals of *three minutes*.

Kyz Aùl Bank.—A dangerous horse-shoe shaped bank, about one mile in length, and breadth, with isolated patches of less than 6 feet, lies south-eastward of Kyz Aùl point. From a shoal patch on its eastern edge Kyz Aùl lighthouse bears N.N.W. $\frac{1}{2}$ W. distant $1\frac{1}{2}$ miles.

Buoy.—A bell buoy is placed in about 5 fathoms close to the eastern edge of the bank.

Spitfire Rock.—Another dangerous rocky bank, lying nearly 3 miles to the south-east of the above, was discovered in H.M.S. *Spitfire* in May 1855. The least depth found was 24 feet, but probably there is less; it lies 5 miles S. $\frac{1}{4}$ W. of cape Takli, and is in the fairway for Kertch strait in coming from the westward. Cape Chaouda open southward of Ilchan-Kai rocks leads southward of Spitfire rock; and the highest tumulus over Ak-burnú open of cape Takli, leads eastward of it.

Another shoal, of 5 fathoms depth, lies $1\frac{1}{4}$ miles S.W. by W. of Spitfire rock.

CHAPTER IV.

KERTCH STRAIT AND SEA OF AZOV.

VARIATION in 1884.

Kertch strait -	-	1° 0' W.		Berdiansk -	-	0° 30' W.
Taganrog -	-	Nil.		Ghenitchesk	-	1° 15' W.

KERTCH STRAIT.—Western Shore.—The western shore of Kertch strait from cape Takly to cape Yenikale will first be described.

Cape Takly (Takill), about 270 feet in height, and forming the south-west extremity of Kertch strait, lies $4\frac{1}{2}$ miles north-eastward of Kyz Aùl point. The old light tower, white with grey lantern, stands on the summit, and being elevated 330 feet above the sea is a conspicuous day mark.

Lifeboat.—A ten-oared lifeboat and rescue station is established $2\frac{1}{2}$ miles north-westward of cape Takly.

Niger Rock.—Cape Takly is bordered by a reef, which commences at Kyz Aùl (Yenicheh Takli) point, where it extends only 2 cables from the coast, but near the cape it runs out in a south-east direction for about three-quarters of a mile. Niger rock near the eastern edge lies S.E. by S. from the old light tower (sea mark), and 6 cables distant from the shore. A depth of 5 fathoms will be found along the edge of the reef, but a vessel not seeing the buoy, which may be adrift, should give cape Takly a berth of at least two miles.*

Buoy.—A beacon buoy coloured red, with flag, is moored eastward of Niger rock, with the sea mark on cape Takli bearing N. 38° W., distant $1\frac{1}{4}$ miles.

About two-thirds of a mile to the northward of the northern extremity of cape Takly, the coast falls back a little to the westward, forming a point, abreast of which, at half a mile from the shore, lies a reef with a depth of only 6 feet, and 5 fathoms at its edge. To the northward of it, 4 fathoms will be found at half of a mile from the shore. Another reef, with a depth of only 3 feet, lies nearly half a mile from the shore, $3\frac{1}{2}$ miles N. by W. $\frac{1}{2}$ W. of cape Takly, abreast of a cliff between Chongelek point and the coastguard station south of it, and at the back of which is an extensive salt lake, which may be seen from the deck of a vessel,

* See Admiralty plan of Kertch strait, and Kertch strait and adjacent coast, No. 2,205; scales, m = 2, and 0.5 inches.

over a strip of sand dividing it from the sea. Near the edge of the reef there are 5 fathoms water, and the shore from thence to Kamysh (reedy) point may be approached to 3 cables, where a depth of 20 feet will be found.

Kamysh Burun (91 feet high), situated about 8 miles northward of cape Takly, will be easily recognized. It is the northern termination of the coast hills, and a coastguard station and mill lie about half a mile to the southward of it ; a few rocks border the point.

From thence, the shore is low and sandy, terminating at 2 miles to the N.N.E. in a low sandy peninsula about 400 yards in breadth, bold to approach, having about 18 feet water, at one cable from the shore. Westward of the peninsula is a lake three-quarters of a mile in length, north and south, which has a depth of 12 feet, and communicates with the sea by a narrow and shallow channel, only practicable to small coasting vessels, drawing about 5 or 6 feet water.

Ambélaki Bay.—From the entrance to the lake, the coast trends a short distance to the westward, and then north-eastward to cape Paul, forming between them the small bay of Ambélaki, which has a depth of from 14 to 20 feet water, affording anchorage in from 2 to 3 fathoms at 3 cables from the shore ; avoiding the bank of 6 feet in the western part of the bay, 2 cables from the shore, and from which Kamysh *red* light bears W. $\frac{1}{4}$ N. distant $4\frac{1}{2}$ cables. The bay is, however, exposed to north-easterly winds.

LEADING LIGHTS.—A fixed *red* light is exhibited from a lighthouse on the edge of the cliff at Kamysh, $2\frac{1}{2}$ cables to the southward of the lazaretto. The light is elevated 102 feet above the level of the sea, and in clear weather should be seen from a distance of 11 miles.

Also, a *fixed* white light is exhibited from a lighthouse at Churubash bearing W.S.W., westerly, distant 5 miles inland from Kamysh light ; it is elevated 344 feet above the sea, and in clear weather should be seen from a distance of 27 miles.

The lights in line bearing, W.S.W., westerly, lead in the channel between Tusla bank spit and the shoals off Ak-bouroun.

CAPE PAUL is of moderate height, with a strong battery and some buildings on it, and lies 5 miles to the north-eastward of Kamysh point. At a mile to the north-eastward is Ak-bouroun (white cape), remarkable both for its colour and its numerous hillocks, on one of which stands a white house, visible at a long distance.

LIGHTS.—The lighthouse of cape St. Paul (Pavlofski) is situated 400 yards from the shore, one mile westward of the cape. It exhibits two *fixed* white lights visible in the clear channel leading up to Kertch strait, between the bearings of N. $\frac{1}{2}$ W., and N.N.W. $\frac{1}{2}$ W., visible in clear

weather from a distance of 17 miles. At a distance the two lights appear as one.

Tide Signals, indicating according to the International Code the depth in the Kertch-Yenikale channel, in feet and quarters of feet, will be shown from the flagstaff on Yenikale point, and from the guardship which is moored east-north-eastward of the beacon buoy off Ak-bouroun.

Fort.—The fortress of Kertch, which is of the first class, stands on cape St. Paul, and covers the adjacent heights, which rise 300 feet above the sea. The ground on which it stands has been cut up by ravines and burrowed in all directions. The fortifications consist of solidly built works, intended for defence both from land and sea. The latter are so constructed as to compel all vessels attempting an entrance into the strait, to pass under a concentrated fire from the formidable batteries. Casemated barracks have been constructed sufficiently large to hold a garrison of 10,000 or 12,000 men, in perfect security from projectiles of every description.

A small pier harbour has been constructed south-east of the fort, just eastward of cape St. Paul, named port Kamysch, which is probably only for the use of the garrison.

KERTCH.—From Ak-bouroun the coast falls back 2 miles to the north-westward, forming a circular bay $2\frac{1}{2}$ miles wide, at the bottom of which stands the town of Kertch. The town is modern, with one long street and a quay, presenting a pleasing aspect compared with many other Russian towns. Including Yenikale, it has a population of 23,000 inhabitants, but it does not promise to be of much importance until the provinces about the Don enjoy a higher civilization. There is little produce shipped from Kertch, and since quarantine has been abolished for vessels entering the sea of Azov, the chief part of the vessels, after taking pratique, proceed to load at Berdiansk, Marioupol, and Taganrog. A few vessels await their cargoes here from Rostoff-on-Don, particularly in the fall of the year, when there is a fear of being caught by ice in the sea of Azov.

Kertch occupies the site of the ancient Greek colony of Panticapæum, once the queen city of the Cimmerian Bosporus, now Kertch strait. The name Kertch, or more properly Kerch, is a corruption of the name Kherséti, which the Turks gave to the fortress erected here by the Genoese.

Consul.—There is a British Vice-Consul at Kertch.

Communication.—There is steam communication between Kertch and Poti, occupying 60 hours. The steamer calls at Novorossisk, Túapsé, and Soukhoúm Kalé, *en route*. From Poti the Russian Steam Navigation Company run steamers to Batoum, Trebizon, and Constantinople.

LIGHT.—The fixed *red* light shown from [the wharf at Kertch, is visible between the bearings N. 47° W. and N. 77° W. over the clear ground leading to the anchorage off that town. It is 36 feet above the sea, and in clear weather can be seen 7 miles.

KERTCH ROAD.—Anchorage.—Vessels completing their cargoes in Kertch road generally anchor in 15 feet water at 2 miles from the town; thence it gradually shoals to the shore where a depth of 12 feet will be found at a short distance off. Too near approach to the guard ship is to be avoided.

Vessels are prohibited from anchoring anywhere on the line of the leading lights for Kertch strait, and those wishing to anchor between Tuzla spit buoy and the channel beacons to the eastward, must anchor one cable southward of the line of light; here is a depth of about 23 feet.

At a small projection before the town, which divides the head of the bay into two bights, are the remains of an ancient mole, 2 or 3 feet under water, extending in 300 yards in an east-south-east direction. A red beacon marks the extreme. The bight to the southward of the mole bordered by a long sandy beach, serves as an anchorage as well as that to the northward, and with slightly deeper water. Several landing places have been constructed for coasters.

A small sunken rock, marked by a perch, lies 2 cables southward of Kertch light, and one cable from the shore. The northern bight is partly choked up with mud, which is carried into it by a rivulet. It is, however, preferable to the southern bight, there being 11 feet water half a cable from the shore, and it is sheltered from N.E. and E.N.E. winds, which are considered dangerous, especially to vessels anchored at the entrance of the bay. Losses occur annually, especially to coasting craft, and during the dreadful storm, on 2nd November 1849, 27 vessels were lost. The reef off Ak-bouroun breaks the sea with a southerly wind. Owing to the influx of fresh water from the sea of Azov, and the ice which the current conveys, the bay freezes for a certain length of time every winter, but not farther than Kamysh point. The fields of ice which float about, often drive vessels on the banks of the strait, where they are sometimes wrecked.

The Quarantine establishment, $1\frac{3}{4}$ miles to the eastward of the town, is marked by a flag-staff. Vessels in quarantine anchor in any convenient depth with a good holding ground, but exposed to S.S.E. and East winds. There is a depth of 12 feet at 2 cables from the shore.

Yenikale.—The town of Yenikale stands on a point at the narrowest part of the strait, about $5\frac{1}{2}$ miles to the eastward of Kertch, and E. by N. $\frac{1}{4}$ N. $4\frac{3}{4}$ miles from Ak-bouroun. A fortress is erected on

the curve of a steep shore, which gives the point a peculiar appearance. A broad sand flat, with from 4 to 10 feet, which begins one mile to the westward of the town and terminates at the point, extends three-quarters of a mile to the southward, to the dredged channel of 18 feet.

Krougoi Bank, situated about one mile S.E. by E. of Yenikale point, is $1\frac{1}{2}$ miles in length and about three-quarters of a mile in breadth, with depths of 7 to 12 feet over it. Its northern edge has been dredged to a depth of 18 feet, forming a part of the new channel to the sea of Azov.

Anchorage.—A vessel seeking an anchorage off Yenikale may approach the fortress and the sandy shore to the northward of it, which is named by the Russians Opásnaya (dangerous), to within a half or third of a mile, where there is a depth of about 15 feet. Vessels from the sea of Azov used formerly to anchor here and discharge part of their cargoes, to enable them to pass the shallows to the south-westward, but a channel (the work of several years) has been dredged to a depth of 18 feet.

CAPE YENIKALE.—LIGHT.—Cape Yenikale (Fanar) lies about $2\frac{1}{2}$ miles north-eastward of Yenikale. A hill rising from the cape to the height of 340 feet, has a lighthouse 68 feet in height erected on it, which exhibits at an elevation of 409 feet above the sea, a *flashing* white light of the first order, every *half minute*. It is visible between the bearings of N.E. $\frac{1}{2}$ N. through west and S.S.E., and may be seen in clear weather at the distance of 25 miles. Between the cape and Opásnaya beach, there is a depth of 8 feet in a little inlet formed by the shore receding to the westward. Beyond the cape the strait widens out, and at 5 miles N.N.W. of the lighthouse beyond a sandy beach, is a cape named Julia.

EASTERN SHORE.—Having described the western or Krimean shore of Kertch strait, we will now proceed to the eastern or Taman shore, commencing from the southward at cape Kishla.

Cape Kishla (Jelezni-Rog) with its flat summit and steep cliff, lies at the foot of a hill between Bugaz estuary (the mouth of Kouban lake) and cape Panaghia.

Kishla Reef.—At 5 miles W. by S. $\frac{1}{4}$ S. from Bugaz, and $2\frac{1}{2}$ miles S.E. $\frac{1}{2}$ S. from cape Kishla, is Chernyshev, an 18-feet isolated patch, which is the south-east extreme of a long and narrow reef, named Kishla, which thence curves for $2\frac{1}{2}$ miles north-westward towards cape Kishla, from which, its northern extremity bears S.W. by S. distant three-quarters of a mile. This reef as well as those westward of it, is the more dangerous as the cape is not easily recognized, having nothing on it to distinguish it from the rest of the coast, which has the same bold appearance. It has patches with depths of from 5 to 18 feet, with 5 fathoms at its edges, and there is a depth of from 5 to 6 fathoms between the reef and the rocks.

which front cape Kishla, which rocks extend 3 miles to the eastward of it, and half a mile from the shore. There is a depth of about 4 fathoms between the northern end of Kishla reef and the cape.

At about 3 miles westward of the centre of Kishla reef several rocks were discovered in April 1855, by the vessels after which the rocks are now named.

Highflyer Rock (Aksenof), with 14 feet water, lies with cape Kishla bearing N.E. by E. 3 miles, and cape Panaghia N.N.W. $\frac{1}{3}$ W. 4 miles. A patch of 28 feet, also named Askenof, lies N.W. 2 miles from Highflyer rock.

Volski, a patch of 18 feet lies nearly $1\frac{1}{2}$ miles, E. $\frac{1}{4}$ S. of Highflyer rock ; another with 30 feet, named Viper (Savenko) rock, the same distance S.E. ; and a third, Andreyef, of 28 feet, E.S.E., $2\frac{1}{2}$ miles from Highflyer rock ; but it is probable that all the ground between Highflyer rock and cape Kishla is foul ; vessels, therefore, ought to pass outside, by keeping cape Tuzla open to the westward of all the islets lying off cape Panaghia.

Cape Panaghia lies $4\frac{1}{2}$ miles W.N.W. from cape Kishla, and nearly midway between, a spit of about 3 fathoms extends one-third of a mile from the shore ; but the mariner will be on his guard since, as before remarked, this space appears to be foul ground. In passing the cape give it a berth of 2 miles, to avoid the foul ground off the group of islets which front it ; these make the cape easy to recognize.

Fulton Rock.—From the islets off cape Panaghia, a ridge of submerged pinnacles of rocks resembling the islets, extends W. $\frac{1}{2}$ N. ; the outermost at nearly $1\frac{1}{2}$ miles distant, with only 3 feet over it, is named Fulton rock, after a French steamer of that name. All these dangers will be cleared by keeping cape Yenikale lighthouse open of cape Tuzla.

Bell Buoy.—A bell buoy painted black, is placed westward of Fulton rock.

Between Panaghia rocks and cape Tuzla, which lies $3\frac{1}{2}$ miles N.N.W. the coast should be given a berth of at least one mile, to avoid the rocky bank which borders the shore, and which at $1\frac{1}{4}$ miles south of cape Tuzla extends three-quarters of a mile off. Some of the rocks forming this bank are awash, others have from 5 to 8 feet over them, and between those that lie near cape Tuzla, and which extend half a mile from the shore, there is a depth of from 18 to 20 feet.

Tuzla Bank, a sand bank 7 miles long and $1\frac{1}{2}$ miles broad, stretches out to the northward from a position one mile north of cape Tuzla, in the direction of cape Paul, and nearly bars the strait, leaving a passage of half a mile in width. A long narrow strip of sand rises from this bank, named

Youjnaya (South) spit, which extends 6 miles from the shore in the direction of the bank, and is prolonged under water for another mile. A coastguard station is situated on the sandy spit, $3\frac{1}{2}$ miles north of cape Tuzla. The bank has a depth of 2 fathoms about three-quarters of a mile from the sand spit, and 3 fathoms at 2 miles distant.

LIGHT VESSEL.—A light vessel, named Tuslinski or Kertchenski, painted black, is moored in 19 feet water, near the south-west extreme of Tuzla bank, which exhibits at an elevation of 15 feet above the sea, a *fixed* white light, visible in clear weather a distance of 6 miles.

Fog Bell.—In thick or foggy weather, one stroke of the fog bell is given *every minute*.

The vessel has a black ball at the main, and flies a yellow flag with blue cross when at her station.

When summer seamarks are replaced by winter seamarks, the light vessel is removed and her position marked by a black perch with flag.

Anchorage will be found to the southward of the bank, when N.E. winds or the strength of the current prevent vessels from turning to windward. Large ships anchor to the westward of cape Tuzla in from 35 to 40 feet water.

Taman.—From cape Tuzla the coast bends sharp round eastward to the town of Taman, which lies about 5 miles from the cape. The coast between is bordered by rocks, but there is a depth of 12 feet a quarter of a mile from the shore.

TAMAN LAKE.—About a mile to the eastward of the town stands Phanagoria fort, and thence the coast trends nearly 2 miles north-eastward, where Vezimsk spit, a tongue of sand with 3 to 12 feet, projects one mile to the northward, nearly meeting a similar spit which extends $2\frac{1}{4}$ miles southward from Roubanova point, leaving only a narrow passage of 13 feet into the lake. The lake is nearly 10 miles long, $3\frac{1}{2}$ miles broad, and carries a depth of from 12 to 16 feet, over mud and shells.

Chuskhia Spit is a tongue of sand, stretching 9 miles, in a south-west direction, from a point 4 miles south-westward of cape Kamenoi (rocky cape), which is the northern extremity of the coast of Taman. Its western edge is even and straight, but on its eastern side there are many indentures, which vary its breadth from half a cable to half a mile. A flat, which carries a depth of from 12 to 4 feet, surrounds it, and its southern end projects nearly 3 miles north-westward towards Kertch. The channel to Taman lake lies between this bank and Youjnaya spit, and is three-quarters of a mile wide with a depth of about 13 feet. Ak-bouroun on a N.W. $\frac{3}{4}$ W. bearing astern, leads through, between the red and black perches on the adjacent sand banks.

Buoys and Beacons.—At various times additional buoys have been placed in Kertch strait; at the present date they are as follows:—Five red buoys in from 12 to 18 feet water mark the circular edge of the bank extending from Ak-bouroun point. The north-eastern buoy is surmounted by staff and ball, and is the turning mark to Kertch anchorage.

A red and white chequered beacon is placed near the edge of the shoal water extending eastward from Yenikale fort.

The newly dredged channel, $5\frac{1}{2}$ miles long and about 250 feet broad, with a depth of 18 feet, is marked at its southern entrance by two buoys; the one on the starboard hand (entering the sea of Azov) is chequered black and white, and that on the port hand is chequered red and white. In addition to these buoys, about twenty pairs of floating beacons of the same colours mark the sides of the channel.

Also a black beacon, pyramid shape and 60 feet high, surmounted by horizontal bars, is erected on cape Pekli, at an elevation of 267 feet; and a white beacon of similar height and shape, surmounted by a triangle, is erected on the shore near Chuskha spit, at an elevation of 93 feet, $4\frac{3}{4}$ miles distant from the former. These beacons in line, bearing E.N.E., easterly, lead in the fairway of the newly dredged channel.

Tuslinski light vessel (painted black) marks the south-west edge of Tuzla bank, and a black beacon with ball the north-west edge; a red buoy or perch, marks the south-east side of the small patch of 17 feet (just south of the line of leading lights), situated S.W. by S. 6 cables from cape St. Paul. The best water is eastward of the red buoy, but on no account must a vessel pass eastward of the beacon marking the north-west extremity of Tuzla bank.

Two buoys mark the passage to Taman lake, between Tuzla bank and the south-west end of Chushka flat. The buoy on the south-west side is black.

On the north shore of Kertch strait, between the country house of Souvorousky and the Opasny cordon, a row of small buoys with red flags as top marks, are laid out annually, about 6 cables from the shore, to mark the fishery limits; from 1st October until navigation is closed by ice.

When navigation is closed by ice, these buoys and beacons are removed, and winter seamarks (poles or perches) substituted.

Directions.—From a position midway between cape Takly and the shoals westward of cape Panagchia, a N. by W. $\frac{1}{2}$ W. course will take a vessel to and westward of Tuslinski light, the channel fairway; the buoys and beacons of the channel will then come into view: black, or black and white buoys and beacons, should be kept on the starboard hand; and red and white buoys and beacons on the port hand. (In the daytime, the red buoy on the south-east side of the 17-feet patch may be left on either

side.) Having passed the 17-feet patch, Churubash and Kamysh lighthouses in line astern, bearing W.S.W., westerly, or the black and white beacons on the north-east shore of the strait, in line ahead E.N.E., easterly, will lead through Kertch strait, with the red and white chequered buoy and beacons on the port side, and black and white chequered buoy and beacons on the starboard side. When past the last or north-easternmost beacons, course must be altered more to the westward to avoid a 15-feet patch which is almost in the line of the leading marks, whence a central course may be taken into the sea of Azov. The depth of water in the channel is shown from the guard ship and from the signal staff at Yenikale point. It is known to vary as much as 3 feet by wind and other circumstances.

At Night. Kertch strait must be approached with cape St. Paul light in sight (visible between the bearings of N. $\frac{1}{4}$ W. and N.N.W. $\frac{1}{4}$ W.) which will lead eastward of the shoals off cape Takly, and westward of those off cape Panaghia. Tuslinski light vessel will be seen when within 6 miles, and which in passing must be kept on the starboard hand; Yenikale light will be shut in with the land when within one mile of the light vessel. When about one mile from cape St. Paul lights, course may be altered to the eastward to bring Churubash and Kamysh lights in line astern, taking care not to lose sight of St. Paul lights until they are so; a course nearly E.N.E. with lights in line astern will lead through Kertch strait; when near the Azov end of the strait, Churubash light must be opened to the northward of Kamysh light to avoid a 15-feet patch near the extremity of the channel; course may then be shaped for the sea of Azov.

Caution.—The positions of buoys and beacons are not to be depended on, and these directions are given with a view that masters of vessels may be enabled to have some check on the pilots, of whom there have been many complaints of wilful stranding of vessels.

THE SEA OF AZOV lies between the parallels of $45^{\circ} 17'$ and $47^{\circ} 17'$ N., and the meridians of $34^{\circ} 51'$ and $39^{\circ} 19'$ E. Its length, on the parallel of 46° is 127 miles, and its breadth on the meridian of $37^{\circ} 19'$ is 97 miles. From Kertch strait to the Don is 160 miles.* Its extreme length from Tonka beach (the south-west extremity) to the Perevólká mouth of the Don is 197 miles.

The northern coast of this sea is from 90 to 130 feet in height, and of a reddish appearance. On its surface, which is flat, a few small hillocks may be seen. Extensive spits of sand, bordered by banks, are formed around all the promontories, and being subject to the influence of the currents of the Don, trend to the westward.

Its eastern coast, from Temriuk bay to the Don, inhabited by the

* See chart of Black sea, sheet 5; sea of Azov, No. 2,284; scale, m = 0.17 inches.

Chémoi-morskoi or Black sea Cossacks, is low, and divided by lagoons. The western coast is formed by a narrow and long peninsula, named Tonka (narrow) or Strelka (arrow), that separates this sea from the Sivash or Putrid sea, which receives several of the Krimean rivers, and where salt is made. A part of the Krimea and the island of Taman form the southern shore, on which are some hills, which serve as landmarks.

The greatest depth of this sea is about 44 feet between Kertch strait and Bielo-sarai (white house) spit on its northern shore, but it diminishes greatly in the gulf of Azov, having but 30 feet at its entrance and 8 to 11 feet in the roadstead of Taganrog. By observations, it is said that from 1706 to the year 1808, the depth of the gulf has diminished three feet; from the latter date to 1833, it has again diminished three feet; so that it has lost six feet depth in 127 years. The sand banks have also increased in extent, and others have formed which render its navigation more difficult.

The bottom is of mud mixed with shells, which are generally black, but of a reddish colour along the eastern shore. The water is of a dull yellow colour, but the quantity poured into it from the river Don makes it always fit for use at some distance to the westward of Taganrog.

The rivers which empty themselves into this sea on the northern shore, are the Sambek, Mious, Kalmious, Berda, Katsa Berdyanka, and the Obitotchna. On the western shore, Bol Utlinka river discharges into Oukliouk liman; and the rivers Salghir, Kara-Sou, Bulganak, the two Yandols, and the Subachi, flow from the Krimea into the Sivash, which in its turn empties itself by Ghenitchesk strait. The peninsula of Kertch does not contribute even a rivulet. Along the eastern coast beyond the lower and upper Temriuk lakes, are the rivers Protok (a branch of the Kuban), Talghirsk, the Kirpilí which flows into Okhtar lake, the Beysough into that of Beislich-koi, and the Ghei, and Kagalnik, which have their issue near the Don.

Current.—There is little current in this sea (except in Kertch strait), for even with a strong N.E. wind, it does not run more than a mile an hour, and if a southerly wind should follow after a calm, it flows for a short time in a contrary direction.

Its general course from the river Don is to the westward, towards Bielo-sarai spit, where it divides, the larger stream taking a southerly direction for Kertch strait; the other, following the northern shore, meets, between Obitotchna and Beriutch spits, the water flowing through Ghenitchesk strait from the Sivash. This junction determines their course to the southward, along the Tonka or western shore towards Kertch strait.

Ice.—The navigation of this sea is usually rendered impracticable by ice, except between the beginning of April and end of November.

Cape Kamenoi (Rocky), which forms the eastern point of entrance to Kertch strait, is of moderate height, steep, and of a reddish colour. It is bordered by rocks, which will be avoided by keeping one mile from the shore, where there is from 18 to 20 feet water.

TEMRIUK BAY.—**Pekli Point** lies about 4 miles E.S.E. of cape Kamenoi, and thence the coast continues east-south-eastward for 20 miles to the entrance of the upper Temriuk lake, which lies at the bottom of Temriuk bay. The shore from Pekli point is lower, and intersected by several little ravines. At $10\frac{1}{2}$ miles S.E. by E. $\frac{1}{2}$ E. of the point a large opening will be seen choked with sand, named **Aktanizovka**, the eastern side of which is formed by a narrow portion of land 9 miles in length, of little height, terminating eastward in another collection of sand, at the extremity of which lies the entrance to the upper Temriuk lake; a beacon 36 feet high stands on this point.

On the slope of the hill above, stands the northern leading beacon for Kertch channel.

Temriuk.—The village of Temriuk stands on the western extremity of a peninsula, which divides the upper Temriuk lake from the lower. Near the village the lakes communicate by a narrow channel, through which the waters of the lower or western lake, fed by branches from Kuban river, flow with great rapidity into the upper. They are very shallow, and only navigable by flat-bottomed boats.

Anchorage.—In the month of May, vessels arrive for cargoes of fish, for which these lakes are celebrated. They anchor in the bay, with Temriuk church, (which is conspicuous, and visible at a good distance from the shore,) bearing about S. by W. at $1\frac{1}{2}$ miles from the entrance, in 16 or 17 feet water, over mud and sand.

Beacons.—Two beacons on Temriuk west point, when kept in line, lead to Temriuk lake in the best water, and admit small craft drawing 6 feet.

Achuev.—**Anchorage**.—Eastward of Temriuk the coast is low and sandy, trending to the northward and eastward for 30 miles to Achuev, where vessels may anchor abreast of the mouth of the northern branch of the river Kuban, named Protok (Cherno-Protsk), at 2 miles from the shore, in a depth of 4 fathoms; and also abreast of Sladkii (Sweet) rivulet, 7 miles to the south-westward. Depths of 15 to 20 feet will also be found along the coast for 22 miles to the northward, as far as Okhtar liman, to the eastward of which the land becomes a little more elevated, and is marked by two hills.

Beislich-Koi.—From Okhtar liman to Kamisheva point, which bears N.N.W. 22 miles, the coast falls back to the eastward and forms a large bay, 12 miles deep, but its shallowness deters vessels from approaching

its shores. A depth of 16 feet will, however, be found at from 6 to 8 miles from the coast.

Eastward of the bay is Beislich-Koi, a lake about 20 miles in length, the entrance to which is nearly closed by a projecting spit of sand, about 7 miles long, extending from the southern shore. A fishery station is established on this spit about 4 miles from its northern extremity.

Kamisheva Point, is the northern extremity of the large bay just described. Mills are situated near the point, eastward of which is a church and village. A spit of sand extends south-eastward a distance of $3\frac{1}{2}$ miles from Kamisheva point, beyond which to the southward, at the distance of $2\frac{1}{2}$ miles, there is a depth of 18 feet.

Jelezin Bank, of about $1\frac{1}{2}$ miles in length in a north and south direction, with a least depth of 17 feet, is situated 23 miles W.S.W. of Kamisheva point, and about 30 miles W.N.W. of the entrance to Okhtar lake. From this bank, shoal water extends for the distance of 10 miles, east-south-eastward, with depths of 19 to 20 feet; from thence a ridge of about 22 feet extends to the shore. Two miles westward of the bank the depth is about 30 feet.

Dolga Point.—From Kamisheva point the coast becomes a little elevated, and trends north-north-westward for 15 miles to Dolga (Long) point, from whence Dolga spit, a sandy projection 9 miles in length, extends in a north-westerly direction; about $2\frac{1}{2}$ miles to the southward of Dolga point is a hill or cliff named Obriv, and on which is a church and a few farms.

Elenia Spit.—Two banks project off Dolga point; the first, Elenia spit, with from 8 to 16 feet water, and triangular in shape, extends W. by S. for 15 miles from the point. There is a patch of 8 feet at 9 miles from the shore, and only 16 feet at 15 miles. A flat, which is the continuation of this spit, extends 9 miles W.S.W. from its extremity, with from 18 to 25 feet on it.

Dolga Islet and Bank.—The second bank runs off in a N.N.W. direction for 6 miles from Dolga spit.

About one mile within the extremity of the bank, is Dolga islet, 2 feet above water, and nearly one mile in length.

Beacons.—On the northern extremity of Dolga island is a mast beacon with crossyard 35 feet in height. Also, a black buoy beacon lies in 20 feet, marking the north-west extremity of Dolga bank.

Fishing huts are erected on Dolga point as well as on all the sandy points of this sea. Being built on posts, in order to preserve them from

being carried away by inundations, they have, when seen from a distance, an appearance as if floating on the water.

GULF OF AZOV.—This gulf is divided into three basins, formed by the different banks which border its coasts; the first is that of Marioupol, bounded by Dolga and Bielo-sarai spits to the westward, and by Sazalnits and Krivaia banks to the eastward. The second is the Sazalnits basin, which is formed between the latter banks and Chimbour and Petrushina banks to the eastward. The eastern basin is that of Taganrog, which lies at the head of the gulf.

Gheisk Liman.—From Dolga point the coast turns to the eastward for 25 miles to Gheisk or Yeisk liman, which is of an oblong form, about 13 miles in length from east to west, and 6 in breadth from north to south. The entrance, about $2\frac{1}{4}$ miles wide, is formed between Glafiro point and Gheisk spit, a low narrow strip of sand extending 4 miles in a N.E. by E. direction from New Gheisk, and which protects the liman from northerly winds. A tongue of sand, named Naiben spit, runs off in a southerly direction for 2 miles from Glafiro point, and then bends the same distance to the eastward partly under water. This liman would form an excellent anchorage, but its maximum depth is only about 6 feet water, with from 13 to 9 feet in the entrance.

Beacons.—Two beacons, each 60 feet high, mark the entrance to Gheisk liman, the one on the extremity of Gheisk spit being surmounted by a triangle, and that on Glafiro point by a crossbar.

Gheisk.—The town of Old Gheisk stands at the head of the liman, at $1\frac{1}{2}$ miles to the northward of the mouth of the river Gei, and is very populous. A commercial town, named New Gheisk, or Yeisk, was founded by Prince Woronzoff in the year 1848, on the western sandy point of the entrance, near the deeper water, and has rapidly increased. A road of much importance leads south from Gheisk to Jekaterinodar, on the Kuban, by which communication is kept up with the army of the Caucasus.

Sazalnits or Petchany Bank.—From Glafiro point the coast runs 6 miles to the northward, and then 3 miles north-eastward to Sazalnits spit, a low sandy point. An extensive bank of sand extends in a north-westerly direction from this coast, with a depth of about 8 feet, and 12 to 15 feet at its edges, with several islets about 5 miles from the shore rising from it, named Petchany or Sandy isles, on which are several fisheries.

Beacons.—Two beacons, black, about 500 yards distant from each other, erected on the western point of entrance to Gheisk liman, when in

line bearing S. $\frac{1}{2}$ W., lead in the fairway between the shoal stretching south-eastward from Petchany island and that from Sazalnits bank. This passage is only suitable for small coasters.

Cockerill Shoal is an isolated patch of 14 feet, about 12 miles W.N.W. of Sazalnits spit, and may be considered the north-west extremity of Sazalnits bank. Between this shoal and Krivaia spit, 5 miles to the north-north-westward, is the fairway channel to Taganrog.

PETCHANY LIGHT VESSEL.—At the extremity of Sazalnits bank, in 22 feet water, on the south side of the channel, a light vessel is placed; showing *two fixed* white lights placed vertically, at 22 and 34 feet high on the mizen mast, which should be visible in clear weather about 6 miles.

The vessel is painted black, with *Petchany* in yellow letters on her sides; the day marks are a ball at the main and yellow flag with blue cross.

From the light vessel, Krivaia spit bears N. 54° W., distant $5\frac{1}{2}$ miles.

When navigation is closed (officially so in November), the vessel is removed, and her position marked by a black perch.

Fog Signal.—In thick or foggy weather, a steam whistle is sounded, giving blasts of *four seconds* duration, separated by intervals of *twenty-two seconds* duration. In the event of this whistle becoming damaged, a bell will be sounded.

Chimbour Spit.—From Sazalnits spit the coast curves E. by N. $\frac{1}{2}$ N. for $17\frac{1}{2}$ miles to Chimbour spit, which lies north-east of two hillocks and the town of Margaritovka. From this spit a triangular shaped bank projects 8 miles in a north-westerly direction, with depths of from 8 to 12 feet, and 15 feet at its edges.

Buoy.—Its extremity is marked by a red beacon buoy, placed in $15\frac{1}{2}$ feet water, with Taganrog point bearing N.E. $\frac{1}{2}$ N., the Zolotaya or Golden bank light vessel W. $\frac{3}{4}$ S. 7 miles, and the church of Margaritovka S.S.E. $\frac{1}{2}$ E., distant $8\frac{1}{2}$ miles.

Between Chimbour spit and Otchákov spit, $9\frac{1}{2}$ miles east-north-eastward, the depth is only 8 feet at 2 miles from the shore, and 8 miles to the eastward of this spit is the entrance to the southern branch of the river Don, near the village of Kagal.

RIVER DON.—This river, the ancient Tanais, falls into the sea at the head of the gulf of Azov by several mouths, from the village of Kagal, as far as Siniavki, 12 miles to the northward. It overflows its banks in May, but returns to its usual limits at the end of June or beginning of July.

This noble river, which flows from lake Ivan, in the government of Tula, runs south-eastward to within 40 miles of the Volga, when it turns abruptly to the south-west for 240 miles and falls into the head of the gulf of Azov, its whole course being about 900 miles. It has much more active trade than any other river of Southern Russia.

The principal mouth is that to the southward, bearing the name of the Don. The second, 2 miles to the northward, is the Kalanecha; the third, nearly 4 miles to the northward of the latter, the Perevóloka; the fourth, at 1½ miles to the northward, the Kuliuma; and the fifth, the Mertvoi Donetse (dead or still,) near Siniavki. These entrances are only passable by small craft, lighters, &c., which bring cereals to vessels loading in Taganrog roads. Above the entrances and on nearing Rostoff, the Don becomes deep, and continues navigable for a considerable distance.

AZOV.—The ancient town of Azov, reduced at the present day to a small place, stands on the southern bank of the river Don, at 6 miles from the sea.

Rostoff-on-Don, of which Taganrog may be considered the seaport, is situated on the right bank of the Don, 45 miles by train from Taganrog, and 20 miles by the river. It is the largest and most commercial town in the sea of Azov, and the second commercial centre on the south coast of Russia, the palm being given to Odessa. It is the principal terminus of the three great railways, and is the dépôt for all the produce of the rich territory between the Don and the Caucasus mountains, whence it is carried down the river and to the roadstead of Taganrog in lighters and steam barges. Its great obstacle is the *ghirla*, or bar, on which at times there is little or no water. Its industries are considerable, and the ordinary population is about 69,000, but when navigation is open, &c., it is about doubled.

Besides the linseed, wheat, tallow, wool, rye flour, and iron which are exported, large quantities of munitions of war, such as shot, shell, cables, anchors, &c., from Lugan, about 100 miles above Rostoff, are yearly sent to the Krimia and Circassian coasts. Vessels of 5 feet draught can proceed up to it.

Once during the summer of 1882, the bar of the river Don became dry, easterly winds having prevailed for several days which prevented all communication with the roadstead and shipping.

TAGANROG.—From the Mertvoi Donetse mouth of the Don the coast trends to the westward for 9½ miles to Armenia point, and from thence it recedes to the north-west, forming the bay of Taganrog, 2½ miles

deep, in which there are only from 2 to 6 feet water, and into which the river Sambek runs. The town of Taganrog stands on its southern point which bears S.W., 5 miles from Armenia point. From Taganrog, wheat and tallow are exported; it is one of the three privileged ports for the importation of foreign goods, and is also the great entrepôt for the commerce of the rivers Don and Volga. On account of the shallowness of the sea of Azov, part of the produce is shipped in coasters to Kertch, Kaffa and Odessa. The shipments are principally made to England and the Mediterranean ports. Anthracite coal is obtained at a short distance from Novo Cherkask, and at Lughan, and is sent down the Don for the use of the Russian steamers in the sea of Azov.

At the extremity of Taganrog point are the remains of a small harbour, nearly 3 cables in length, and $1\frac{1}{4}$ cables in breadth, constructed by Peter the Great, in which there are not more than 3 feet water; but there is a stone quay, resting on piles to the eastward of the harbour, of which it forms one of the sides. Lighters and even vessels of a small draught of water take in and discharge their cargoes alongside the pier, which is connected with the town by a good macadamized road. The water which runs from the river Sambek into Taganrog bay increases the depth here to 8 feet at high water.

Taganrog has large and numerous warehouses, and many very handsome private dwellings. The climate is temperate, and remarkably healthy; the surrounding country is fertile, and produces excellent fruits and culinary vegetables. The vine and mulberry flourish, but the country is destitute of wood. Population in 1880, about 63,000.

Lifeboat.—There is a ten-oared lifeboat stationed here.

It has been proposed to construct a new harbour at Taganrog, and a railway from the town in a westerly direction to the harbour, to be continued on to piers, stretching a considerable distance into the sea, and thus connect the harbour directly with the town, but up to 1882 no improvements of any kind had been carried out, and what is called the new quay (finished in 1872) is fast falling to pieces through neglect, and no facilities for embarking or loading have been made of late years.

Navigation.—The ice broke up most unprecedently early in the spring of 1882; the first steamer arrived on the 16th March, but some accidents occurred by collision of steamers with floating ice. At the end of March full spring weather was established.

On November 21st, navigation was officially closed by the removal of the light vessels to their winter quarters, but the weather continued so mild that several steamers remained at anchor well into December, when it

became prudent for them to retire to Kertch to complete their loading. The gulf was only thinly covered with ice at the end of the year.

Trade.—During the year (1882), 962 vessels cleared from this port with cargoes, principally cereals, the total tonnage being 485,687 tons (two-thirds of which were British), of this number 457 were steamers. The value of the exports amounted to 6,126,032*l.*, and the imports 154,000*l.*; this also includes Rostoff-on-Don.

Cherepак (Tcherepat). At the distance of $1\frac{1}{2}$ miles S.S.E. of Taganrog is the low sandy island of Cherepак, on which stands a black beacon 26 feet high, surmounted by a barrel. Near the island there is a depth of 9 feet, with 12 and 14 feet to the westward.

Petrushin Bank.—The coast from Taganrog point recedes to the westward, forming a small bay, the southern extremity of which, Petrushin point, lies $3\frac{1}{2}$ miles W.S.W. of Taganrog point. A bank with depths of 6 to 8 feet, extends $4\frac{1}{2}$ miles to the southward of Petrushin point, gradually deepening to 14 feet at 6 miles from the point, muddy bottom, in which position is placed a white beacon buoy, with the following bearings: Taganrog point N.N.E. 8 miles, and the red beacon buoy at the extremity of Chimbour bank W. by S.

Anchorages.—Inner Roadstead.—The inner roadstead of Taganrog is about 6 miles long and 3 wide between Petrushin and Chimbour banks, with from 15 to 19 feet.

The greatest depths at the head of the gulf, from the Perevóloka mouth of the Don to the southern extremity of Petrushin bank, are 10 to 11 feet, but they are approximate, as it is impossible to give the true depths, on account of the land winds, which reduce them considerably, and in some places there is often no water at all. South or west winds increase the depth, and north and east winds diminish it to 2 or 3 feet, so that persons often walk on dry land from Cherepак island to Taganrog, and sometimes the bay of Taganrog is nearly dry.*

Outer Roadstead.—The anchorage ground used by large vessels shipping cargo, is about 25 miles from the port, or midway between Petchany and Beglitz light vessels. All communication is carried on by steam barges, tugs, and lighters.

* Heavy claims for demurrage were made at the Consulate by masters of vessels in the latter part of 1882, in consequence of stormy weather and the prevalence of easterly winds, which blew all the water out of the upper part of the gulf, and thus prevented communication with the roadsteads for 10 or 12 days.—Consular Report, part III., 1883.

Ballast.—Severe regulations exist respecting throwing overboard the stones forming vessels' ballast, which are required to be landed; but this regulation is seldom attended to, as the distance is great, and the roadstead is thereby severely injured. Latterly the fine has been raised to 150 roubles without much effect, as the cost of a lighter per trip is 115 roubles. At Kertch, the hatches of all vessels are sealed before leaving for Taganrog, and a heavy fine imposed should the seals be found broken or tampered with. This sealing of the hatches causes much delay and annoyance.

Golden Bank.—From Petrushin point the coast trends about W. by S. $8\frac{1}{2}$ miles to Zolotaya or Golden spit, from which the extremity of Beglitz spit bears W.S.W. nearly 4 miles. Golden bank is the continuation of the Petrushin, and extends 3 miles to the southward of Beglitz spit, at which distance there is a depth of about 12 feet.

BEGLITZ LIGHT VESSEL.—A light vessel is moored in 14 feet water at $4\frac{1}{4}$ miles to the southward of Beglitz spit, which exhibits two *fixed red* lights, one on each mast, at an elevation of 36 feet above the sea, but she is removed during the winter to Taganrog. The following bearings show her position: Fursova village N.N.E., Chimbour beacon east 7 miles; and Petchany light vessel W. by S. $\frac{1}{4}$ S. $15\frac{1}{2}$ miles. The depths between the southern extremity of the Golden bank and the Chimbour bank, are from 16 to 18 feet, at about midway between the two shores.

Krívaia (Crooked) Spit.—From Beglitz spit the coast trends west-north-westward about 9 miles to Platova, thence west-south-west to Nordveka point, which bears W. $\frac{1}{2}$ S. distant 15 miles from the extremity of Beglitz spit. A sandy projection extends 4 miles in a south-west direction from the point, terminating in Krívaia (crooked) spit, which can be approached within half a mile on its eastern side, where there is a depth of 12 feet, but a bank extends to the south-west, with a depth of 6 feet, at $1\frac{1}{2}$ miles distant from the spit beacon, from whence it trends to the westward.

Beacons.—A beacon has been placed on the extremity of Krívaia spit, and a red buoy on the southern edge of the shoal extending from it, 2 miles S.W. by S. of the beacon.

Mariopol.—From Nordveka point the coast trends to the westward for 26 miles to the town of Mariopol, which stands on the right bank of the river Kalmious, where it joins the sea. Wheat is exported from this place, but a less quantity than from Taganrog or Berdiansk. The value of cereals exported in 1882 amounted to about 530,000*l.*

Anchorage.—Vessels anchor about 2 miles to the southward of the river in from 15 to 16 feet water, muddy bottom, and good holding ground,

but the roadstead is open from S.W. round by south, to East. Nearer the shore there is a depth of 14 feet over a sandy bottom. The boats which load and discharge the vessels in the roads are kept in the Kalmious, which might be made deeper if measures were taken for dredging the bar which obstructs the mouth, on which there is only a depth of 3 or 4 feet. Five miles eastward of Marioupol, sand banks extend off Lyapina, a distance of 2 miles, and on which are several islets.

DIRECTIONS.—The best course to be steered by vessels after clearing Kertch strait, if bound for the gulf of Azov, is about N. by E. for about 70 miles, from which position Berdiansk point electric light, should be in sight bearing about W. by N. On this course the water will gradually deepen from 5 to 7 fathoms at 40 miles from the strait, but beyond that distance it diminishes. For an extent of 60 miles from the strait the bottom will be of mud, but to the northward it will be mixed with sand. Eastward of this track the water becomes shallower, and on approaching the shore the bottom is composed of reddish shells, but westward of the track the water is deeper and the bottom mud.

With Berdiansk point light bearing W. by N., 9 miles, course may be altered to N.E. to pass about 3 miles southward of Beilosarai lighthouse, and when it bears N.W. distant about 3 miles, a course E. by N. $\frac{1}{4}$ N. for 36 miles will lead through Marioupol basin, southward of Krivaia spit beacon and northward of Petchany light vessel (moored off Petchany or Sazalnitz spit); on this course the depths will be from 36 feet off Beilosarai, to about 18 feet when nearing the light vessel. From Petchany light vessel, course may be shaped to pass about half a mile southward of Beglitz light vessel, the average depth between them being about 20 feet; vessels of heavy draught anchor in the outer roadstead, about midway between them, but light draught vessels continue on for Beglitz light vessel, leaving her on the port hand, and when she bears about W.N.W., steer north-eastward for about 6 miles, passing northward of Chimbour spit beacon, when the depth will have decreased to 16 feet; with Chimbour beacon bearing South, a vessel will have entered Taganrog basin, and may then steer E.S.E. about 5 miles.

Vessels may anchor here about 9 or 10 miles S.S.W. of Taganrog in about 18 feet, but small craft may continue their course, and when Petrushin white floating beacon bears N.W. haul north-north-eastward, and either anchor according to draught, or bring up close to the quay and haul stern in, as is the custom for coasting steamers and other small craft, to receive or discharge cargoes.

Return Voyage.—On the return voyage southward towards Kertch strait, it will be prudent in unsettled weather to steer a little westerly to

avoid the risk of being embayed on the low eastern shore with N.W. winds, which are very prevalent in this sea. On nearing the strait, three hills will be recognized, two of which are 6 miles W.N.W. of cape Fanar, the third being the cape itself, which seen from a distance appears separated from the rest of the coast.

Bielosarai Spit.—From Mariupol the coast is bold and trends south-westward for 10 miles to Bielosarai point, from which Bielosarai spit (similar in form to Krivaia spit) extends 5 miles in a south-west direction to the lighthouse, thence in a west-south-west direction for 2 miles, to its extremity. Numerous fishing huts are built on this beach.

Beacon.—Near the extremity of Bielosarai spit is a mast beacon 60 feet in height.

Caution.—Great caution should be exercised when approaching these several low spits in the gulf of Azov, especially at night, as they are scarcely discernible, and several vessels have stranded on Bielosarai spit when leaving the gulf, for want of proper precautions.

LIGHT.—The lighthouse on Bielosarai spit is within the beacon, about 2,726 yards from the extremity of the spit; it exhibits a *fixed* white light at an elevation of 74 feet, visible in clear weather 10 miles.

The Coast.—From Mariupol a depth of 14 feet will be found along the coast to the south-westward, a mile from the shore, and the same depth half a mile from the eastern shore of the spit, but the water shoals to the S.W. and West of the lighthouse, and that depth will only be found at 2 miles from the spit. North-westward of the lighthouse, where the shore is steep and bordered by cliffs, there is 16 feet at a mile from the shore. At 5 miles to the northward of the lighthouse a ravine may be recognized, in which stands the village of Alti; from thence the coast trends 18 miles W.S.W., to the river Berda, the entrance to which is barred by a sand bank. On the eastern bank of the river Berda stands the fortress of Petrovskoi.

Anchorage will be found in about 22 feet, with the fortress bearing N.W. distant about 2 miles.

BERDIANSK POINT.—From the fortress of Petrovskoi the extensive sand spit of Berdiansk extends in a S.W. by S. direction for the distance of 12 miles, terminating in Berdiansk point, the southern portion, of about 5 miles, being in some places only a cable wide.*

LIGHT.—A lighthouse 79 feet in height stands about 230 yards from the extremity of Berdiansk point, and exhibits an electric *flashing*

* See plan of Berdiansk road, No. 2,209; scale $m = 1$ inch.

white light every *five seconds*. It may be seen in clear weather 10 miles. The light being refracted upwards may possibly be seen a greater distance. This light is styled Berdiansk lower light.

Beacons.—A beacon mast 53 feet in height, and surmounted by a chequered ball, has been erected on the north-west extremity of Berdiansk spit, as a leading mark to the anchorage for small craft.

Buoys.—Two red buoys which lie respectively S.S.W. $\frac{3}{4}$ W. distant $1\frac{1}{10}$ miles, and S.W. by W. $\frac{1}{2}$ W. $\frac{9}{10}$ of a mile from Berdiansk point lighthouse, mark the extremity of the shoal water extending from the point.

BERDIANSK.—This town stands on the western part of the sandy spit, 7 miles N. by E. of the lighthouse and at a short distance from the bold table land which backs it. The port is open earlier and later in the season than that of Taganrog, and draws its supplies from the flourishing German colonies on the Moloshna in its vicinity, which never send their produce to Taganrog. The river Katsa Berdyanka flows into the sea 4 miles to the westward of the town.

Trade.—The value of the exports of cereals in 1882, which far exceeded previous years, was 1,671,158*l.*, and the imports amounted to 22,217*l.*, carried by 248 vessels of 79,125 tons; 14 vessels only were British. Navigation commenced about the middle of March.

LIGHTS.—A lighthouse painted white, and named Berdiansk upper light, is erected on the rising ground about $2\frac{1}{2}$ miles north-westward of the town, from which is exhibited at an elevation of 165 feet above the sea two *fixed* white lights, placed vertically, visible through an arc of 30° , or between the bearings of N. 17° E. and N. 47° E., a distance of about 15 miles. From a distance these two lights appear as one.

Harbour Lights.—From the ends of the breakwater 700 yards in length, constructed in 14 feet depth, to shelter small vessels, fixed lights are shown at 17 feet elevation; *red* at the S.E. end, and *green* at the N.W.; visible 2 miles.

Anchorage.—The usual anchorage for small vessel is off the landing place, in about 10 feet water, but the coast to the westward scarcely affords any protection from westerly and N.W. winds. There is, however, a little well sheltered port formed on the western side of Berdiansk spit, about $2\frac{1}{2}$ miles southward of the town, by a spit projecting from it to the northward, where the coasters resort for winter quarters and sometimes careen and repair. It has a depth of 7 and 8 feet, but it is feared that the shallows, which extend $1\frac{1}{2}$ miles to the northward from the spit, with from 2 to 5 feet water on them, will soon close up the port and form a salt lake, like the others near it.

Directions.—Small vessels of less than 10 feet, having passed westward of the buoys off Berdiansk spit, may steer to bring lower Berdiansk lighthouse in line with the beacon on the spit, bearing S. $\frac{1}{4}$ E.; this mark astern will lead in not less than 10 feet to the anchorage off the town.

Deeper draught vessels should pass about 2 miles westward of lower Berdiansk light, and steer in for the lighthouse on the hill westward of the town, when it bears about N.E. by N. At night the lights will be in sight between the bearing of N. 17° E. and N. 47° E.

These directions must be used with caution.

Obitotchna Spit.—From Berdiansk the coast is bold and clifly for 19 miles in a W. by S. $\frac{1}{2}$ S. direction, to where Obitotchna spit, another sandy projection, begins, and which extends S.W. by S. for the distance of 14 miles.

Beacon.—A cross-yard beacon has been placed near the south-west extremity of Obitotchna spit, from which Berdiansk point light bears E. by N. $\frac{1}{2}$ N. distant about $27\frac{1}{2}$ miles.

Obitotchna Banks.—A bank extends 6 miles south-eastward from the spit, with a depth of 6 to 9 feet, and 12 at its edges. Shoal patches of 15 and 18 feet, lie respectively, 11 miles E.S.E. and 12 miles E. by N. $\frac{3}{4}$ N. of the spit beacon, with from 22 feet to 30 feet between them. These have been named the Obitotchna banks.

Marmion Bank, with a depth of 12 feet, and about 4 miles in length, north and south, lies about 4 miles distant from the shore, with the south extreme bearing N.E. by E. $\frac{1}{2}$ E., distant 14 miles from Obitotchna spit beacon. There is a depth of from 16 to 18 feet between it and the shore.

Anchorage.—The river Obitotchna flows through a ravine into the bay to the northward of the spit, which appears to afford better anchorage than that of Berdiansk. A depth of 19 feet will be found at 5 miles S.W. of the river.

Kiril.—From the mouth of the river Obitotchna, the coast trends west and south-westward for 40 miles, to Kiril point, on which stands some houses and windmills. The point is preceded by a sandy shore to the eastward, about 6 miles in length; north-westward is Moloshnoe lake, into which the little river Moloshnia flows.

Bank.—At the distance of $3\frac{1}{2}$ miles S.E. by E. of Kiril lies the centre of a bank of 16 feet, which extends in a N.E. by N. and S.W. by S. direction a distance of 5 miles.

BERIUTCH (FEDOTOVA) SPIT.—The peninsula of Beriutch extends from Kiril point S.W. by S. a distance of 12 miles,

preserving the breadth of about a quarter of a mile ; it then increases in breadth, and forms Fedotova spit, which trends south-westward for 11 miles to Beriutch spit, its south-west extremity, then north north-eastward 4 miles to Stagshorn point, where it is $3\frac{1}{2}$ miles wide. A small piece of tableland, which appears to have been detached from the coast, intercepts the peninsula at 4 miles from Kiril point.

Bank.—A depth of 18 feet will be found along the eastern side of the peninsula three-quarters of a mile from the shore, and at the distance of 4 miles, a bank with a least depth of 20 feet, extends the whole length of and parallel to the peninsula.

LIGHT.—A stone circular lighthouse, painted white, is erected on the south-west extremity of Beriutch spit, from which is exhibited at an elevation of 85 feet above the sea, a *fixed* white light, visible through an arc of 315° , or between the bearings of W. by S. and S.W. by S., and should be seen in clear weather from a distance of 15 miles.

Beacon.—A black beacon, 60 feet high, surmounted by uprights and cross bars, lies ten miles north eastwards of Beriutch spit lighthouse, and serves to mark the low peninsula.

OUKLIOUK LIMAN lies between Beriutch peninsula and the table land which terminates at Ghenitchesk ; it is about 30 miles in length in a north-easterly direction, and about 7 in breadth.

There is a depth of 22 feet in the entrance, which is about 6 miles wide, westward of the bank extending from Beriutch spit, gradually decreasing to 15 feet westward of Kiril, a distance of 20 miles ; from which position the water gradually shoals to its head.

On the western shore, abreast of Beriutch peninsula, is Atmanai lake, south-westward of which are Derevnia and Bosknia villages.

Banks.—Westward of Beriutch spit, the eastern point of entrance to Oukliouk liman, shoal water extends for the distance of 3 miles from the lighthouse, where there is a depth of 11 feet, from which position the bank turns northward, parallel to the spit, the depth N.W. of Stagshorn point being 15 feet at the distance of $2\frac{1}{2}$ miles, thence the bank trends eastward with the shore.

The western shore of the entrance, south of Ghenitchesk strait, has a depth of 21 feet at the distance of one mile from the shore ; but abreast and north-eastward of Ghenitchesk the depth is only 18 feet, at 2 miles distant.

GHENITCHESK STRAIT.—The entrance to the Putrid sea is through Ghenitchesk strait, which lies within Oukliouk liman entrance,

and N.W. by W. $\frac{1}{4}$ W., 9 miles from Beriutch spit lighthouse, and is formed between the southern bold tableland which borders the northern shore of this sea and the northern extremity of the Tonka. It is about 130 yards broad, and deepened to 10, 12, and 16 feet by the current to which it gives a passage, but there is only a depth of 4 feet on the bar at its entrance. The village stands on its northern shore.

The value of cereals shipped from this port in 1882 was about 70,000*l.*

Roadstead.—There is a very good roadstead between the strait and the spit, in from 18 to 21 feet water, over a muddy bottom, at about midway between the two shores, and open only to the S.S.E.

LIGHTS.—A lighthouse, built of stone, two-storied, and square-shaped, painted white, has been erected near the town of Ghenitchesk, from which is exhibited two *fixed red* lights, placed vertically, visible over an arc of 22° , or between the bearings of N. 12° W., and N. 34° W. The higher light is elevated 81 feet above the sea, and should be visible in clear weather from a distance of 10 miles.

Directions.—In entering Oukliouk liman for Ghenitchesk road, the lighthouse at Ghenitchesk kept on a N.N.W. bearing, or at night the *red* lights in sight, leads clear of all dangers.

The **Sivash** (or Putrid sea) is divided into two irregular gulfs or branches one of which runs westward to the isthmus of Perekop, and the other extends south-eastward towards Kaffa bay, receiving the waters of several rivulets from the Crimea. The whole of this part is very shallow, even for boats.

The **Tonka** (narrow) or **Strelka** (arrow) of Arabat is the western boundary of the sea of Azov, separating it from the Sivash. It is a very low and narrow sand strip, 60 miles in length, slightly curving south-south-eastward from Ghenitchesk to Arabat fort. The shore on its eastern side is higher than that on the western, from the quantity of sand that has been washed up by the sea almost on an even line: on the other side, however, it is very uneven, and formed of vegetable earth. Its breadth is irregular, the narrowest parts being half a mile across; a post road runs along it.

Bank.—At 22 miles N.N.W. of Arabat, a bank has formed with a depth of 9 feet at 4 miles from the shore, and 14 feet at 5 miles; but between it and Ghenitchesk strait, a depth of 18 feet will be found at a distance of a mile from the coast, over a bottom of sand and shells.

Beacon.—A beacon 60 feet high is erected on the Tonka, abreast of this 9 feet bank, from which the outer extremity bears N.E. by E., 5 miles.

ARABAT BAY AND FORT.—The ancient fortress of Arabat stands near the southern extremity of the Tonka, at the bottom of Arabat bay. A little commerce is carried on at this place, vessels anchoring ~~abreast~~ of it at a mile from the shore, in about 22 feet water over a muddy bottom, but the bay is much exposed from N.W. to N.E. The sandy coast terminates at Arabat, bending round E.N.E. for 13 miles to Kiten point; it then trends N.E. by N. for 7 miles to Kazantip point, which forms the northern extremity of a peninsula projecting into the sea from the Krimea.

Kazantip Anchorage.—Kazantip point is of moderate height, bold to approach, and its eastern extremity affords shelter against North and N.W. winds in from 15 to 20 feet water over a muddy bottom, but the Wrangler patch of 10 feet, lying S.E. by S. one mile from the east point, must be avoided.

Chagani point bears E. by S. 9 miles from Kazantip, and between them the coast falls back 5 miles to the southward, forming a deep bay carrying a depth of 25 feet over a muddy bottom at a mile from the shore; it is bordered by a beach, and is exposed to N.W. and N.E. winds. From Chagani point the coast trends to the eastward, and as far as Kertch strait, is backed by hills.

Bagatoubi point lies nearly 9 miles eastward of Chagani, and near it is the salt lake named Chokrak. From thence the coast bends to the south-eastward, and about 2 miles further on is Ziouk point, a small elevation connected to the mainland by a strip of sand projecting to the northward. Between Chagani and Bagatoubi points, a bank extends in a north-west direction for 3 miles from Ziouk point, with a depth of 15 feet on it, but there is a depth of 30 feet between it and Bagatoubi point.

KHRONI (JULIA) CAPE lies 10 miles E.S.E. of Ziouk point, and between them the coast recedes a little to the southward, forming two bays, separated by Tarkan point, off which a depth of 30 feet will be found a mile from the shore. From cape Julia the coast trends S.E. by S. for 5 miles to Cape Yenikale, which forms the western point of entrance to Kertch strait.

CHAPTER V.

THE CAUCASIAN OR EASTERN SHORE, FROM KERTCH
STRAIT TO BATOUM.

VARIATIONS in 1884.

Soujak bay -	-	$0^{\circ} 30' W.$		Batoum	-	-	$0^{\circ} 15' W.$
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KUBAN LAKE.—The channel leading into Kuban lake is formed between Bugaz point, the extremity of a narrow sandy projection extending three-quarters of a mile south-eastward from Taman island, and the north-west point of Jimiteia peninsula. It is about 250 yards broad, and has a depth of 19 feet, but seaward of the entrance there is but 5 feet, with 30 feet three quarters of a mile off shore. The lake is only navigable by flat-bottomed boats. On Bugaz point stands a large building, and the village of that name, and there are 5 or 6 houses on the point of Jimiteia peninsula.*

Foul Ground.—In standing towards Bugaz estuary from the westward, care must be taken to guard against the foul ground which extends fully 3 miles southwards from cape Kishla ; cape Tuzla should be kept open of Panaghia outer islet, until the Bugaz bears E.N.E., and great attention should be paid to the lead.

Mary Magdalene (Megæra) Rock.—H.M.S. *Megæra*, 1855, when running down the coast from the westward, towards Jimiteia, found a dangerous rock about $1\frac{3}{4}$ miles from the shore. This rock with a least depth of 2 feet, and a patch of 4 feet, a cable distant from it, lies S.E. nearly 5 miles from Bugaz estuary, and S.W. $\frac{1}{4}$ W. distant 2 miles from the western beacon. There is a depth of 15 feet at a quarter of a mile S.E. of the shallow heads, and 10 fathoms at half a mile distant. Between the rock and the shore there is a depth of 5 fathoms. Cape Panaghia open of cape Kishla N.W. by W. $\frac{3}{4}$ W. leads southward of the rock.†

* See Admiralty chart of Black sea, sheet vi., Fort Anakria to Kertch strait, No. 2,235 scale, $m = 0.13$ inches.

† See Admiralty chart of Kertch strait (Kertch strait and adjacent coasts), No. 2,205 ; scale, $m = 0.5$ of an inch.

Beacons.—Two beacons on the shore serve as marks for Mary Magdalene bank. The western mark, 57 feet high, a mast surmounted by a chequered square, is $5\frac{1}{2}$ miles east-south-eastward of Bugaz estuary; the eastern mark, 114 feet high, is a mast with two horizontal bars, and bears S. 72° E. distant $2\frac{1}{2}$ miles from the western mark. It also serves as a pilot signal station.

The western beacon kept on a N.E. by E. $\frac{1}{2}$ E. bearing, leads westward of Mary Magdalene bank.

Jimiteia.—The peninsula of Jimiteia is about 15 miles in length, serving as a dyke to the waters of Kuban lake. It takes an E.S.E. direction from Bugaz point, and towards its middle rises a platform of about 3 miles in length, the sides of which are steep and of a reddish tint. At 11 miles from the Bugaz is the fort of Jimiteia or Ukiplenie, erected to command the road to Taman which runs along this isthmus; it is now in ruins. There is said to be a depth of 4 fathoms along the peninsula, about half a mile from the shore, but great attention must be paid, especially during light and variable winds, as the current which generally runs to the N.W. along the Caucasian coast takes its direction here towards the land; the ground also is rocky and foul.

South-eastward of the peninsula there are several hills and a plain, bordered by a sandy beach, which trends round to the southward, and forms the roadstead of Anápa, the western point of which is comparatively low and flat.

ANÁPA.—The fortress of Anápa occupies the whole southern shore of the roadstead, and lies S.E. $\frac{3}{4}$ E. 20 miles from the Bugaz. It stands on a projecting crag of a long slope from the most western mountains of Circassia, which slope is prolonged northward and eastward, towards Kuban lake. The circumference of the fortress is about three-quarters of a league. On the south and west sides its walls rise from a perpendicular calcareous rock, nearly 200 feet in height, but on the north, the land slopes towards the roadstead; some bastions, and on the side of the plain a ditch, defend the fortress, which could not resist an European army.* Formerly a very considerable commerce was carried on at Anápa with the Circassians, which consisted of wheat, rye, butter, furs, wax, and staves.

The population is about 2,000 persons.

Water.—There are some wells of brackish water in the fortress, which is not drank; that which is used is brought in barrels from the Tughur river, which, after having meandered in the plain, used some years ago to discharge its waters into the sea at a quarter of a mile northward of the fortress. Mounds of sand have since formed

* See Admiralty plan of Anápa bay, No. 2,221; scale, m = 6·6 inches.

at its mouth, and it is only in winter that it has the power of forcing a passage.

Bank.—A rocky bank with a least depth of 8 feet, extending in an east and west direction for the distance of 3 cables, lies to the northward of Anápa fortress, its eastern extremity bearing N.N.E. distant 4 cables from Anápa point.

DIRECTIONS.—In coming from the southward, Anápa may be easily recognized by the diminished height of the mountains in its vicinity, and by a long white cliff, which extends to the walls; but in approaching it, when at some distance to the westward, is not so easily made out, as several mountains are seen, which completely change the aspect of the country, but they gradually disappear as the coast is neared. In standing for the anchorage from the southward, a vessel should give Anápa point a berth of at least 4 cables, to avoid a rocky ridge which borders it, and extends eastward as far as the second bastion; also the isolated bank before described.

Anchorage.—The best anchorage is in the outer road, in about $5\frac{1}{2}$ fathoms, mud and sand, with the western tangent of the fortress bearing S.S.W. distant about 6 cables; but it is exposed from N.W. to S.S.W.; more to the westward the bottom is mixed with gravel.

The inner anchorage of about 2 fathoms, for small craft, south-eastward of the 8-feet bank, is sheltered from S.W. winds, and also protected from the sea by the foul ground to the north-westward. It may be entered by the channel between the 8-feet bank and the fortress, and in which there is a depth of 3 fathoms, or by passing northward of that bank.

The beach eastward of the town is bordered by a bank, with 3 fathoms on its edges at a distance of three cables from the shore. Small vessels must be careful in standing in, for at a quarter of a mile north-eastward of the town, a bar of sand is formed in the summer season off the mouth of Tughur (Tougour) river.

Land winds from East and N.E. prevail at night, and sometimes are very fresh. Strong sea breezes generally haul round to the northward about sunset and lose their strength.

COAST.—From the small bastion standing at the southern extremity of Anápa, the coast trends south-south-eastward, and the shore, which is bold, gradually becomes higher, terminating about 5 miles to the southward in a steep white cliff, the base of which is washed by the sea. It is steep-to, having 5 fathoms at 2 cables, and 8 fathoms at $2\frac{1}{2}$ cables from the shore.

OUTRISH (SOUKKO) POINT.—At $8\frac{1}{2}$ miles S.S.E. $\frac{1}{4}$ E. of Anápa, between two high reddish cliffs, is a hill about 250 yards in length, covered with brushwood, the extremity of which is named Outrish point. When seen from the north or south it appears like an island, and has often been taken for one, being connected to the mainland by a low isthmus, 350 yards in length, destitute of vegetation. The point is bordered by a shoal extending about $1\frac{1}{2}$ cables to the westward, but there are 8 fathoms close to its edges.

Anchorage.—The shores north and south of the point are clean, and small craft may obtain shelter in the cove to the northward from southerly winds, and in that to the southward from northerly winds, by anchoring close to the isthmus in 5 or 6 fathoms water with a hawser fast to the shore, as the bank is steep.

Sampson Rock.—To the southward of the two reddish cliffs, which back Outrish point, is seen a third cliff, and then a low wooded shore backed by mountains terminating at a prominence 4 miles from the point, named Issussup, which has also the appearance of an island when seen at a short distance from the coast. Sampson rock with a depth of $2\frac{1}{2}$ fathoms, lies abreast of it at half a mile from the shore, with 14 fathoms inside.

Ozerzik.—From Issussup the coast trends E.S.E., and bold white cliffs reappear at the foot of conical mountains with round summits, separated from each other by narrow valleys. That of Dirzye is the most remarkable on account of its beauty; it is followed by another steep cliff, and by a smaller one of angular form. The coast from thence trends more to the eastward, and a rich and picturesque valley comes in sight, which is inhabited, and bordered by a beach slightly receding to the northward forming Ozerzik roadstead, and which is 13 miles from Outrish point.

Anchorage.—The anchorage off Ozerzik is sheltered from winds from W.N.W. through north to E.S.E., with from 4 to 8 fathoms, good holding ground, at 1 or $1\frac{1}{2}$ cables from the shore.

Miskhak Anchorage.—From Ozerzik the coast trends E.S.E. to Miskhak point, which lies at the foot of a steep and elevated mountain. At its base to the eastward is the valley of Miskhak, abreast of which a vessel may anchor, sheltered from all winds from West through north to E.N.E. The shore from thence is low, and runs about 2 miles E.N.E. to a small point, beyond which there is a lake and the low sandy point of Soujak, which forms the western side of the entrance to Soujak bay.

SOUJAK (TZEMESS) BAY.—The entrance to Soujak bay lies between Soujak and Doob points, which bear N.W. by W. and S.E. by E. from each other, distant $4\frac{1}{2}$ miles. The bay is about 8 miles in depth in a north-west direction, from Doob point to the circular beach at its head, which fronts a large wooded valley watered by the rivulet of Tzemess, the waters of which rarely reach the sea. Its western shore is of moderate height, and at a mile from Soujak point, to the northward of the lake, will be seen a ruined Turkish fort, whilst near the beach at the head of the bay is the town of Novorossisk, which occupies the space of 1,200 yards of the shore. The quarantine establishment stands to the southward of it.*

An influential American Petroleum company have their works and place of shipment at Novorossisk, whither the oil is brought by pipes from the wells many miles distant.

A rescue station, with rocket apparatus, is established near Soujak point.

Doob Point, the eastern point of entrance, and on which stands a lighthouse, is remarkable, being surrounded by white angular cliffs, and lying at the foot of a mountain of moderate height. A valley to the northward separates it from the ridge of the Varada mountains, which rise to the height of 1,000 feet, and which border the bay to the north-eastward. Kabardinski fort stands at the head of a bay, at $1\frac{1}{2}$ miles N.E. by E. of the point. Three miles north-westward of the fort is Penai point, composed of steep cliffs, and on which also stands a lighthouse.

Reefs.—A reef extends south-eastward from Soujak point, with 3 fathoms over it at three-quarters of a mile from the shore, and 5 fathoms at one mile from the point.

Middle Grounds.—In mid-channel, and just within the entrance of the bay, lies a bed of sunken rocks, of irregular depths, and within the 10-fathoms line is about $1\frac{1}{4}$ miles in extent from north to south, and the same in breadth from east to west. On its south-eastern part is a patch with a least depth of $2\frac{3}{4}$ fathoms, named Penai bank, about 3 cables in extent north-west and south-east; from its centre, Penai point lighthouse bears N.N.E. distant $1\frac{4}{10}$ miles; and Doob point lighthouse S.E. distant $2\frac{1}{2}$ miles. On the western edge of the Middle ground is a patch of $3\frac{3}{4}$ fathoms, bearing W. by N., distant 8 cables from the south-eastern patch, and from which Penai point lighthouse bears N.E. $\frac{1}{3}$ E., distant $1\frac{3}{4}$ miles.

On the northern edge of the Middle ground is (Scheskari rock ?) a patch

* See Admiralty plan of Soujak bay, No. 2,221; scale $m = 1 \cdot 2$ inches.

of $3\frac{1}{2}$ fathoms, from which Penai lighthouse bears N.E. by E. $\frac{1}{4}$ E., distant one mile.

In the bay north-eastward of Doob point at the distance of a quarter of a mile from the shore, and N.W. by W. $\frac{1}{2}$ W. of Kabardinski fort, is a small oblong reef about 3 cables in length from north to south, with a depth of from $1\frac{1}{2}$ to 3 fathoms.

With this exception, the shores of the bay are clean, with 5 fathoms a quarter of a mile from the coast. Northward of Kabardinski fort the shores become bold and steep.

LIGHTS.—From the lighthouse on Doob point is exhibited, at an elevation of 335 feet above the sea, a *fixed* white light, visible in clear weather from a distance of 21 miles. It is visible from seaward through an arc of 125° , or between the bearings N. 34° W. and S. 89° E.; a sector of light is also shown through an arc of 8° , or between the bearings S. 28° E. and S. 36° E., indicating the channel to Novorossisk (Novo Rossia) road, eastward of Penai bank, and the rock north-eastward of it.

From the lighthouse on Penai point is exhibited, at an elevation of 62 feet above the sea, a *fixed red* and *green* light, visible in clear weather from a distance of 9 miles within the three following arcs, viz. :—

Red, through an arc of 17° , or between the bearings N. 11° E. and N. 6° W., indicating the channel between Doob point and Penai bank.

Red, through an arc of 12° , or between the bearings S. 53° E. and S. 65° E., indicating the fairway to Novorossisk road after passing Scheskari rock.

And *green*, through an arc of 17° , or between the bearings N. 42° E. and N. 59° E., over the 23-feet patch on western part of Penai bank and the small channel to the westward of it.

As a faint light may be visible beyond the limits of these sectors, vessels entering or leaving should keep within the illuminated portions.

Directions.—East Channel.—In standing for Soujak bay at night, Doob point light which is safe to approach, will be in sight when bearing northward of East and may be steered for, until the *red* sector of light from Penai point is visible (between the bearings of N. by E. and N. $\frac{1}{2}$ W.,); course must then be altered to North, or for the light, keeping within the *red* sector, which leads eastward of the Middle ground; and when the *white* sector of light from Doob lighthouse is seen (between the bearings of S.S.E. $\frac{1}{2}$ E. and S.E. $\frac{1}{4}$ S.), it must be kept in sight astern, which will lead northward of the Middle ground, and in mid-channel, until the *red* sector of light from Penai lighthouse is in sight (visible between S.E. $\frac{3}{4}$ E. and S.E. by E. $\frac{3}{4}$ E.), which kept in sight astern leads to the anchorage off Novorossisk.

By Day.—The bearings of the lighthouses, as given in the night directions, will lead safely through the eastern channel. Also, two white beacons are placed northwards of Penai lighthouse, the northern one in line with Penai lighthouse, coincides with the western edge of the red sector of light (N. by E.), and leads eastward of Penai bank; the eastern one in line with the lighthouse, coincides with the eastern limit of green sector (N.E. $\frac{1}{4}$ N.), and leads westward of Penai bank. These beacons are scarcely discernible, but it is proposed to place others more conspicuous. The leading mark for the west channel (between Penai bank and Soujak point) is the steeple of Novrossisk church in line with the Lazaretto and corner of wall, bearing N.W. $\frac{3}{4}$ N. This channel is not recommended.

Anchorages.—Vessels anchor abreast of the town of Novorossisk in about 7 or 8 fathoms water, over mud and sand, about half a mile from the shore. About a quarter of a mile from the town the bottom is of sand small stones, and shells; and at a cable distant there is a depth of from 16 to 18 feet, with 6 to 7 feet close to the shore. This anchorage is considered very dangerous, on account of N.E. winds, which are prevalent from the month of September to the beginning of April; it sometimes blows with the fury of a hurricane, rushing down from the Varada mountains with such violence, and causing such a sea, that vessels are driven on shore. These tempests are preceded by clear weather and by small white flaky clouds above the mountains.

There is also anchorage in the little bay to the northward of Doob point, in from 5 to 10 fathoms, over sand and mud, about half or three-quarters of a mile from the shore, abreast of the fort.

Coast.—The long range of angular cliffs which border Doob point, is broken at $4\frac{1}{2}$ miles to the south-eastward by Ashampe creek, where also is the village of Natukhadi. The coast then trends more eastward, but gradually lessens in height as Ghelenjik bay is approached. A small reef extends about three-quarters of a cable to the westward, from an angle of a cliff not far to the southward of Ashampe point.

GHELENJIK BAY.—The entrance to Ghelenjik bay is about a mile in breadth, between Tliuvieuse point, (which is of moderate height, of a level surface, and without vegetation,) to the south-east, and a low point to the north-west; banks extend from one to 2 cables off these points. A long range of white cliffs extend from Tliuvieuse point in a south-east direction towards Mezip, six of which are of semicircular form.*

The interior of Ghelenjik bay, of an oval shape, is about $2\frac{1}{2}$ miles in breadth from north-west to south-east, and $1\frac{1}{2}$ miles deep. It has a depth

* See Admiralty plan of Ghelenjik bay, No. 2,221; scale, $m=1\cdot 2$ inches.

of 8 fathoms at its entrance, and 5 to 6 fathoms in the middle, over sand and mud, gradually shoaling to the depth of 3 fathoms towards the shore, which is bordered by a bank of sand. The fort lies on the south-eastern shore, northward of which is a small stream named Kounlezi river.

The bay is open from W.S.W. to South, but the winds from that quarter are not dangerous. The N.E. winds, although as frequent and violent as those in Soujak bay, are less feared, as the entrance is open, and vessels anchored in the middle of the bay can slip and stand out to sea. It may here be noticed that the wind blows with more violence in front of the ravines between the spurs of the Varada mountain ridge, than at their projecting points. Vessels intending to remain any time at anchor, should moor with their large anchor to the N.E. There is good anchorage for those of light draught abreast of the landing-place, in 12 or 13 feet water.

Mezip.—(False Ghelenjik of the Turks.) The valley of Mezip lies about 5 miles south-eastward of Tliuvieuse point, at the extremity of the white cliffs. Shelter may be found in the roadstead from N.W. winds, round by north to South, in about $5\frac{1}{2}$ fathoms. Another white cliff will be seen at Khopitsaïi, which is $7\frac{1}{2}$ miles S.E. $\frac{1}{2}$ S. of Tliuvieuse point, eastward of which is the valley of Jankhopi between two bold reddish cliffs, and then a projecting point, named cape Idokopas.

As a general rule, the coast of the Caucasus is bold to approach, with the exception of a few points, which will be hereafter noticed ; the average depths being 6 fathoms at 3 cables, 8 fathoms at 4 cables, and 10 to 12 fathoms at half a mile from the shore.

Cape Idokopas is one of the most projecting points of the coast ; its summit is flat and covered with pine trees, some of which hang over the red cliffs. It is bordered by a reef, and should be given a berth of a quarter of a mile.

Pshad Anchorage.—Eastward of cape Idokopas, the coast composed of roundish cliffs trends 9 miles S.E. by E. $\frac{1}{2}$ E. to Chouko point. Between the eastern of these cliffs and the point, lies the valley of Pshad, in which is situated the small fort of Novo Troitskoi (New Trinity), in ruins. The anchorage is abreast of the valley, which is fronted by a beach, but it is exposed from S.E. by S., round by south, to W. by N. $\frac{1}{2}$ N. A depth of 4 to 5 fathoms, over mud and sand, will be found at $1\frac{1}{2}$ cables from the shore. Care must be taken to avoid some sunken rocks which lie about three-quarters of a cable from the shore, off the mouth of a rivulet, backed by a mountain which bounds the valley to the northward, and also off a small point on the southern shore.

In approaching this anchorage from the southward, Chouko point, of moderate height and flat surface, with cliffs of a deeper tint than those of

Idokopas, will be first recognized ; it has a high conical isolated mountain near it ; then, cape Idokopas and the bold circular cliffs, and in the interior a round summit and a peak, whilst nearer the coast a bare cone tops the other mountains.

Beshi and Tsuepsin Bays.—From Chouko point the coast turns a mile north-eastward to Beshi bay, which affords a good anchorage, sheltered from westerly winds, but open to the southward. From thence it recedes to the northward, and trends again to the eastward to Tsuepsin valley, 6 miles from the point, off which another anchorage presents itself, but is more open to westerly winds.

Fort Michailoff lies on the western side of the anchorage.

Djoubg Anchorage.—At 7 miles E.S.E. of Tsuepsin is the anchorage at Djoubg, which is formed between two headlands. This part of the coast is of white circular cliffs ; the last of them, the headland eastward of Djoubg, is bordered by a bank, and must be given a berth of half a cable.

Shapsuko (Netchepsoukho) Bay lies about $2\frac{1}{2}$ miles eastward of Djoubg, fronting a long valley which may be easily distinguished at a distance by a high mountain backing it to the northward. The valley is watered by a rivulet which reaches the sea through low ground having a considerable beach in front. Here are several block-houses of the Russian fort, Tenginskoi, constructed on the plain, and westward of which is Novo Michailoff. In this bay, as in almost all the roadsteads on this coast, a vessel should anchor at some distance from the shore, in order to be able to clear it, in case heavy weather should come on from seaward. Although this seldom happens, yet it will not be prudent to anchor in less than 5 or 6 fathoms, about 3 or 4 cables from the beach. It invariably occurs along this coast, that immediately the sea gets up, the surf is very strong along the beach, and boats cannot approach it.

From Shapsuko, the coast changes its aspect, the mountains receding farther from the shore, with their bold slopes wider apart, less regular in form, and much lower.

Tou Anchorage.—Tou point lies 10 miles S.E. by S. of Shapsuko ; it may be easily recognized by mount Tou, of conical form, rising from its centre, and which stands to the northward of Tou cove, of about three-quarters of a mile in diameter, at the entrance of a valley. Vessels may anchor here in 5 or 6 fathoms between two cliffs which mark the entrance, and which are bordered by sunken rocks, which extend a cable from the shore.

Touabs Bay.—The coast from Tou anchorage trends to the eastward, and then bends southwards to Chardak point, situated S.E. 8 miles.

from Tou point, and which is immediately followed to the eastward by Touabs bay. This bay will be recognized by the lighthouse on Chardak point, as well as by the Russian fort Veliaminoi, standing on a table-land. The roadstead is open to south and S.W. winds, but protected from the N.W. by Chardak point. Anchorage in 6 fathoms will be found one mile from the shore, and in 10 fathoms at about 5 miles.

LIGHT.—From a lighthouse erected on Chardak point (cape Kadosch), at an elevation of 230 feet above the level of the sea, is exhibited a *fixed* white light, which in clear weather should be seen from a distance of 18 miles.

Coast.—From Touabs bay the coast trends 34 miles S.E. $\frac{1}{2}$ S. to Jobjé point, in almost a direct line, which causes a difficulty in recognizing the different localities along its shore. The lofty summits of the mountains on the coast would serve as landmarks, if they were not so often enveloped in fog or clouds. The most southern as well as the most remarkable, from its singularity of form, is mount Nugaigusé, 10,842 feet high.

Psezouapé Road.—The valley of Psezouapé may, however, be recognized by fort Lazarev, on the bank of a rivulet of that name. The tiles of the fort, of a reddish brown, can be seen through the large trees which adorn the beach. The roadstead is exposed to all sea winds from N.W. to S.E.

Soubeshik Bay lies nearly 9 miles S.E. by S. of Psezouapé, and may almost be mistaken for it, as the aspect of the beach is the same, and the small Russian fort, Golovin (Shakhe), which stands here, has very much the appearance of the preceding one. This anchorage is also much exposed. A rivulet flows into the sea here.

Coast.—From Jobjé point, Sotcha Bitke point, which is of middling height and rounded, bears S.E. 8 miles. The space which separates them forms a large and verdant valley, intersected by hillocks, and bordered by a beach. Fort Mamai Kalé formerly stood here, on the bank of the river Psakhe. Another river, the Sotcha Psta, finds its way to the sea, a little to the northward of Sotcha Bitke point. The Russian fort, named Navaginskoe (Dahovsky), stands on an eminence on the shore, between this river and the point, and is commanded by a stone tower, which may be seen from a great distance. Two block-houses are near the landing-place.

From Sotcha Bitke point, for the space of 7 miles south-eastward, the shore is low, abrupt, and wooded, backed by a mountain named Khukhub.

Current.—The coast current, running to the north-westward, is much felt in this locality.

Khosta, more generally known by the name of Kamisler, where a rivulet flows into the sea, is a little to the southward of Mustakuba point; the low land commences here, covered with magnificent forests, running down to within 20 yards of the beach, and extending beyond St. Douka fort. To the south-eastward some lofty mountains are seen.

FORT ST. DOUKA (Holy Spirit) lies 11 miles S.E. $\frac{1}{2}$ S. of Sotcha Bitke point, and thence the coast trends 2 miles south-eastward to Konstantine point (cape Adler). The fort is a little northward of the mouth of the Mezumta river; a bank of shingle has been formed off the mouth of this river, extending one cable from the shore, at which distance there is a depth of 5 fathoms.*

Anchorage.—There is a depth of 40 fathoms at 3 cables from the shore with the fort bearing N. by E. or N.E. by E.; but between those bearings there is a depth of 20 fathoms at that distance. The best anchorage is in about 10 fathoms, with St. Douka fort bearing about N.E., distant $2\frac{1}{2}$ cables from the shore.

Coast.—From Konstantine point the coast trends 11 miles S.E. by E. $\frac{1}{2}$ E. to the extremity of mount Oschten, which runs boldly down to the sea. At its base is a beach of small extent, on which stands the fortress of Gagri, near the entrance of a narrow pass. The depths here are considerable, and the anchorage indifferent. From the southern side of the gigantic rock of Gagri, a low and wooded land trends for 4 miles southward to the river Bzib; from thence the coast runs $2\frac{1}{2}$ miles south-eastward to Pitsounda point, where, through the trees, may be seen the dome of an ancient church, built about a thousand years ago.

Pitsounda Road.—Eastward of Pitsounda point, which is safe to approach, is a bay which had great reputation among the Turks who frequented this coast. The long and wide beach beginning at the point, extends $1\frac{1}{2}$ miles to the northward, thence trending eastward; several white cliffs reappear here, and extend in that direction as far as Abikhu point, which bears E. $\frac{3}{4}$ S. distant 6 miles from Pitsounda point. The anchorage in this roadstead is inconvenient, there being a depth of from 20 to 25 fathoms a short distance from the coast, and from 6 to 8 fathoms at 30 yards distant. It is also exposed from south to E.S.E. There is a better anchorage, which Russian ships of war prefer, abreast of the first small cliff at the bottom of the bay, which is divided into two portions by a narrow gully, in 18 fathoms muddy bottom, good holding ground, and not very shelving. Small vessels may anchor at one or $1\frac{1}{2}$ cables from the

* See Admiralty plan of St. Douka, No. 2,221; scale, m = 1·2 inches.

shore in 6 or 7 fathoms, but the mud is soft. This is a good anchorage for the vessels that load here with boxwood. It is said that the sea winds seldom blow home, and that little inconvenience is felt from the sea rolling in from that quarter.

There is a small fort on Pitsoundsa point near the church.

Bombori.—The low cliffs beginning in Pitsoundsa road terminate a little to the eastward of Abikhu point; thence the coast trends southward to Souksou point, a distance of 5 miles, forming the roadstead of Bombori. The greater part of this shore is backed by low wooded land, and at a distance by high mountains, remarkable for their being divided into three deep gullies. From some positions may be seen, on an elevation which commands the plain of Bombori, the residence of the Prince of Abkhazes, with an ancient church near it, and nearer the sea the dwelling houses of fort Bombori and part of its suburbs. On the shore are the ruins of a church, a long wooden building, a guard-house, and two or three cottages.

Anchorage.—Vessels anchor at various distances from the shore off Bombori; there are 20 fathoms at $1\frac{1}{2}$ miles, and 12 to 10 fathoms at a mile or three-quarters of a mile distant, sheltered from W.N.W. winds round by north to S.E. When the surf is not heavy, they anchor abreast of the guard-house. Here, as elsewhere on the Caucasian shore, the Anatolian coasting craft are hauled up on shore.

Coast.—From Souksou point the coast becomes irregular, and trends eastward for a distance of 14 miles; it then bends south-eastward to Soukhoúm point, which bears E. by S. $\frac{3}{4}$ S. 20 miles from that of Souksou. Nearly midway between these points may be seen, rising near the shore, two conical hills covered with wood; on that to the eastward are the remains of some ancient walls and two towers, one of which crowns its summit. This locality bears the name of Psereta (ancient Anakonii), as also the river close to it. At 14 miles to the northward of Psereta, between mountains covered with snow, may also be recognized a high vertical rock, surmounted by a peak, and commanding a pass, named by the Turks Piláv Tepezi, and by the Russians Tseferbéia Shapka. Guđavata anchorage lies in the bend of the coast, about 3 miles eastward of Souksou point, but it is exposed to southerly winds, and only used by coasters.

SOUKHOÚM BAY.—From Soukhoúm point the coast trends east-north-eastward for about 3 miles, thence to the southward, forming Soukhoúm bay, which is the station for the Russian vessels employed on the Circassian coast; it affords a good anchorage. In approaching it

from the westward a narrow deep gorge may be seen, bordered by steep precipices, and among their distant summits, white with snow, there is one in the shape of a saddle. The lighthouse on Soukhoúm point several barracks, standing on an eminence at the foot of the mountains, serve also to point out its position. From the southward the village and fortress of Soukhoúm Kaleh may be recognized from some distance, on a plain backed by mountains.*

Soukhoúm point may be rounded close to, as a depth of 30 fathoms will be found a cable from it, but between the point and the fortress, on the edge of a gravel bank, which borders the bight and extends 5 cables from the shore, there is only a depth of 5 fathoms, with deep water close to the southward of it.

LIGHT.—From a circular iron lighthouse, painted white, erected on Soukhoúm point, is exhibited at an elevation of 121 feet above the sea a *revolving* white light, which should be visible in clear weather from a distance of 17 miles.

Anchorage.—The anchorage, which is indifferent, from the steepness of the bank and liability to be blown off, is in about 6 or 8 fathoms, distant from 2 to 3 cables southward of the custom-house, and eastward of the fort, as the depths do not increase so rapidly in this direction; but southward of the fort it shelves off suddenly, to 60 fathoms at a quarter of a mile from the shore. Poles surmounted by chequered balls, 82 yards apart, placed on the north-west and south-east angles of the fort, when in line bearing N. 75° W., indicate the best line of approach to the anchorage. Vessels moor with one anchor to the south-west, and the other towards the mouth of Basla rivulet, which flows into the sea near the quarantine establishment. The bay is open to S.W. winds, which are seldom dangerous; they, however, send in a heavy swell. The land winds are sometimes troublesome.

Kelasou Valley.—At $2\frac{1}{2}$ miles south-eastward of Soukhoúm Kaleh lies the valley of Kelasou. A rapid stream runs through it. A bazaar, backed by a hill on which stands the remains of an ancient fortress, draws a number of coasters here for the purpose of petty trade.

Kodor Point.—From Kelasou the coast trends southwards for $7\frac{1}{2}$ miles to Kodor point, which has given its name to the river flowing into the sea close southward of it. Care must be taken to avoid a bank which extends two-thirds of a mile N.W. from the point.

Coast.—From Kodor point the coast trends 4 miles S.E. by S. to Iskouria point, which is bold to approach; it then bends eastward for 9

* See Admiralty plan of Soukhoúm bay, No. 2,221; scale, $m = 1\cdot2$ inches.

miles to the mouth of the river Tamish, whence it takes a S. by E. direction for 56 miles to fort St. Nikoali.

The whole of the country, commencing several miles northward of Kodor point to beyond fort St. Nikoali, which formerly was the Russian boundary to the southward, is an immense low plain, varied by some slight elevations covered with trees. It is bounded northward by the mountains of the Caucasus, the tops of which are always covered with snow, and to the southward by some of the mountains of Anatolia.

Anchorage.—All the anchorages along this coast are exposed to winds from half the compass, but several of them are frequented by coasters. The first is that of Ochamcher, lying 13 miles eastward of Iskouria point. The next is abreast of fort Anakria, which stands 22 miles farther southward, where the coast projects a little to the westward, and where the river Ingur falls into the sea. Mount Olen lies eastward of this anchorage, about 12 miles from the shore.

Redoute Kalessi.—This town and fortress stand at the mouth of the river Khopi, $6\frac{1}{2}$ miles S.S.E. of Anakria; its commercial communications are of some importance. A flag-staff on the southern side points out the fortress, which, if intending to anchor, should be brought to bear E. $\frac{1}{2}$ S., distant $1\frac{1}{2}$ miles, where there is a depth of 7 fathoms over a muddy bottom. To the north-eastward will be seen three small hills, one of which, mount Olen, is more striking than the others, as it resembles a saddle. It bears from the anchorage about N.E. $\frac{1}{2}$ E., and Poti hill E. by N. $\frac{1}{2}$ N. At this anchorage, with light winds, vessels will ride to the current, which runs to the northward. After severe storms it sweeps along quantities of wood, which float down into the sea from the rivers on the coast.*

Khopi River.—A bar of sand and stones, which is liable to shift, has formed at the entrance to this river, so that flat-bottomed boats or craft drawing less than 5 feet are alone able to pass it; inside the depths increase from 3 to 6 fathoms. In rough weather, the waves being then opposed to the current of the river causes a kind of rapid, which makes it impossible for any craft to cross the bar. This is felt as a great inconvenience, as the surf on the beach prevents goods from being landed outside.

POTI (ancient Phasis), which is the principal of the numerous fortified places on the Caucasian coast, is situated about 7 miles to the

* See also Admiralty chart:—cape Yasoun to Anakria fort, No. 2,236; scale, m = 0.15 inches.

southward of Redoute Kalessi. The population in 1881 was about 4,000. Two small hills lie to the southward, which are slightly higher than Poti and Olen hills to the northward.

The town is a wretched fever-stricken place, built on the swampy delta of the Rion, and has no natural advantages. It is in railway communication with Baku on the Caspian sea, *via* Tiflis. Quantities of naphtha and petroleum are exported, brought by rail from Baku.

Rion River.—The Rion river, like the Khopi, has a bar of sand and stones at its mouth, but inside, the depths increase to 3 fathoms. This river has two entrances, a mile apart, the island formed between being thickly wooded.

Harbour.—A harbour for small vessels has been constructed at the cost of about half a million sterling, and which (in 1880) was being dredged. Probably the bar of the river, which formerly had only 5 feet on it, has also been deepened, but being exposed to westerly gales is constantly silting up, and but for the transit trade, of which this is the principal port, would not be worth the cost of keeping open.

Lifeboat.—There is a lifeboat station and rocket apparatus established on the south bank of the river.

LIGHTS.—From a white lighthouse on the shore, near the mouth of the river Rion, is exhibited at an elevation of 118 feet above the sea a flashing light, showing alternately, *red* or *white*, *every minute*, and visible in clear weather from a distance of 12 miles.

Two leading lights are exhibited at night at the south entrance of the river, when the bar is passable, and when in line indicate the best water over the bar, the outer one is *red*, the inner white; these lights are exhibited from the day mark poles, and are elevated 11 feet and 9 feet respectively, and visible from 3 to 4 miles.

Beacons.—Two moveable beacon poles are situated on the south side of the river, which by day are surmounted by square shields, when the bar is passable; the square surmounting the outer mark is painted red, with a black disc in the centre, that on the inner mark is painted white. When the bar is not passable the day marks are removed, and at night the lights are not shown.

Inside the bar, the starboard side of the channel is marked by red beacons, and the port side by black beacons with a broom pointing upwards.

A mooring buoy is placed in the roadstead, S. by W. $\frac{1}{2}$ W., distant $1\frac{1}{4}$ miles from the lighthouse.

and in from 2 to 4 fathoms, partly sheltered by the breakwater. The bottom of the bay is fronted by a beach.

Water.—To the eastward of Eleusa point near the ruined castle in the bay, there is another beach bordering the entrance of Dégermén valley. A rivulet runs into the sea here, over which is a stone bridge with several arches, from which vessels can complete their supply of water, by boats furnished with hoses.

PLATANA is a small town lying 7 miles to the westward of Trebizon. Its roadstead is good, and is often resorted to by vessels trading with Trebizon; it is also a good winter anchorage, secure against the sea winds, notwithstanding it is exposed from N.N.W. to East. Vessels moor with open hawse towards the shore, as the land winds are violent. From the depth of 25 fathoms, which will be found at three-quarters of a mile N.N.E. of the town, the water shoals gradually to 5 fathoms, over sand and mud, at $1\frac{1}{2}$ cables from the shore.*

Sarganá Point lies $1\frac{1}{4}$ miles N.W. by N. of the town, and is bordered by rocks extending about a cable from the shore. The coast from thence trends north-westward for 5 miles to Zeitún point, which forms the eastern angle of the broad promontory of which cape Ierós is the western.

Cape Ierós.—From Kalmek point the coast bends to the south-west and then takes a north-west direction for 14 miles to cape Ierós, which forms a useful landmark for vessels bound to Trebizon, as it projects to the northward, and has several white patches in its vicinity. Its shores are irregular, of a reddish tint, and a conical hill rises at its extremity.

ZEITÚN POINT.—Anchorage.—Westward of cape Ierós the coast trends to south-westward, and thence north-westward to another Zeitún point, which bears W. by S. $\frac{1}{4}$ S., $10\frac{1}{2}$ miles from cape Ierós, forming a bay in which there is good anchorage abreast of Cheshmeh rivulet, sheltered from West round by south to E. by N.

Koureli and Kara Points.—Koureli point is a low projection of the coast distant 2 miles W. by N. of Zeitún point. Kara point is also low, and lies 10 miles westward of Koureli point.

TEREBOLÍ (TRIPOLI).—This town stands on three small points, which form two coves at $5\frac{1}{2}$ miles W.S.W. of Kara point. It has a population of about 3,000 persons. The western cove is full of rocks, but the other carries a depth of 3 fathoms and will contain 5 or 6 coasters. It is, however, exposed to northerly winds. The best anchorage is in the

* See Admiralty plan of Platana, on plans of ports and anchorages on south shore of the Black sea, No. 2,220; scale, $m = 2\cdot 5$ inches.

being immensely superior to any other on the eastern shore of this sea as far as Kertch strait, but its value is much lessened by the inconvenient depth for anchoring in, which, on the western side of the bay, is 20 fathoms at half a cable from the shore, quickly deepening to 30 and 35 fathoms.

Batoum is the readiest point of internal communication with Georgia, Armenia, and Persia, and is a principal transit port. A fort with arsenal and barracks stands on Batoum point, and another fort similar in form is situated on the south side of the bay, between Bar-shana and Sari-su rivers. There is a church and several mosques in the town.

Communication.—Batoum is in railway and telegraphic communication with Tiflis and Poti; and weekly with Odessa by the Russian Company's steamers, which call at Soukham, Kertch, Theodosia, Yalta, and Sevastópol; time occupied, including detentions, is about 90 hours. There is also telegraphic communication with Trebizon. The population in 1881 was about 3,000, but the place is found to be exceedingly unhealthy. It is not safe to venture in the suburbs without an escort, on account of the numerous bands of marauders.

Trade.—During the years 1879—81, the average yearly foreign trade of the Caucasus was, imports 180,000*l.*, exports 570,000*l.*, whilst the home trade had increased to 2,000,000*l.*, of which 80 per cent. form imports, and 20 per cent., exports.

Shoals.—A bank with 3 fathoms of water, 4 cables in length by about one half a cable in breadth, lies north-eastward of the anchorage. Its western extremity, an isolated patch of 3 fathoms, lies East distant 4 cables from Batoum point, and is marked by a red perch with flag. The north-west edge of the bank is marked by a similar red perch with flag, and bears N.E. by E. distant 6 cables from Batoum point.

In the southern part of the bay, eastward of the consulate, a bank of shingle extends for the distance of 2 cables northward of Sari-su river, increasing to a distance of 4 cables off Ordi-diuss river.

LIGHT.—From a lighthouse erected on the north-west point of Batoum bay, is exhibited at an elevation of 65 feet a *fixed* white light, visible between the bearings of N. 59° E. (through south) and N. 26° W., and should be visible in clear weather from a distance of 13 miles.

Piers.—A small pier has been built for the convenience of the Russian Steam Navigation Company's vessels, and a mole and wharves are contemplated in connection with the railway.

Mooring Buoy.—A mooring buoy is placed in about 35 fathoms of water, about one cable eastward of the arsenal.

Anchorage.—On account of the inconvenient depth for anchoring, and the steepness of the shore, the Russian Company's large steamers moor within a short distance of the town, with stern hawsers to the shore.

Coast.—Westward of Batoum point a bank of 5 fathoms and less extends nearly three-quarters of a mile from the shore. With Batoum light bearing E. $\frac{1}{4}$ S. distant about one mile, 5 fathoms will be found on the outer edge of the bank. Vessels coming from the westward are recommended not to approach the shore within one mile.

Gounieh.—The lowlands which are found near Batoum extend for the distance of 6 miles to the south-west, beyond the mouths of the river Chorúk, of which they are the alluvions, and from their marshy nature they render the west side of Batoum bay very unhealthy from July to October. On the most southern of these mouths stands the town of Gounieh, which carries on a coasting trade. South-eastward of Gounieh is a large valley, through which the river Chorúk flows; beyond the lowlands the mountains gradually get nearer the shore, and are of considerable elevation, and now and then white cliffs appear.

CHAPTER VI.

THE ANATOLIAN OR SOUTHERN SHORE, FROM BATOURM TO THE BOSPORUS.

VARIATION in 1884.

Trebizond -	-	$0^{\circ} 45' W.$		Sinoub	-	-	$2^{\circ} 15' W.$
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ANATOLIAN COAST.—This coast is nearly devoid of ports or harbours, and those that exist are at a distance from each other, and would offer no security to shipping were it not for the mountains which neutralize the effects of the sea winds, which do not blow home. From this circumstance it offers several anchorages which afford shelter from tempestuous weather, although they have not a tempting appearance. Too much reliance must not, however, be placed on this observation, as in certain localities the shelter of the hills is far from being so good as in others. The westerly winds are the most violent on this coast.*

Anchorages.—From Batoum point the coast trends in a general direction about S.W. $\frac{1}{2}$ W. for 43 miles to Kiz Kalessi. The anchorages of Makrialos, 6 miles S.S.W. of Gounieh, and 10 miles from Batoum; of Kiseh, 8 miles beyond Makrialos; and of Sumla, 12 miles farther on, are all more or less exposed to westerly winds.

Seïdol Road.—The roadstead of Seïdol is better, and much used by coasters. It lies about 3 miles eastward of Kiz Kalessi, and 12 miles W.S.W. of Sumla, abreast of Bouleb, which is near Athiná and a river of that name. A hill to the eastward, known to the natives as Eski Tarabozún (old Trebizond) with three perpendicular sides, appears as a table-land covered with trees.

Kiz Kalessi lies to the westward of Athiná, and may easily be recognized by a bold rock on which are the ruins of an ancient castle.

Coast.—From Kiz Kalessi the coast trends south-westward for 6 miles to Kemer point, from thence it continues in the same direction for 12 miles to Parios point. In this distance it recedes about 5 miles to the southward,

* See Admiralty charts:—cape Yasoún to Anakria fort, No. 2,236; scale, $m = 0.15$ inches; Kerempeh to cape Yasoún, No. 2,237; scale, $m = 0.17$ inches; and Bosphorus to Kerempeh, No. 2,238; scale, $m = 0.18$ inches.

and in from 2 to 4 fathoms, partly sheltered by the breakwater. The bottom of the bay is fronted by a beach.

Water.—To the eastward of Eleusa point near the ruined castle in the bay, there is another beach bordering the entrance of Dégermén valley. A rivulet runs into the sea here, over which is a stone bridge with several arches, from which vessels can complete their supply of water, by boats furnished with hoses.

PLATANA is a small town lying 7 miles to the westward of Trebizon. Its roadstead is good, and is often resorted to by vessels trading with Trebizon; it is also a good winter anchorage, secure against the sea winds, notwithstanding it is exposed from N.N.W. to East. Vessels moor with open hawse towards the shore, as the land winds are violent. From the depth of 25 fathoms, which will be found at three-quarters of a mile N.N.E. of the town, the water shoals gradually to 5 fathoms, over sand and mud, at $1\frac{1}{2}$ cables from the shore.*

Sarganá Point lies $1\frac{1}{4}$ miles N.W. by N. of the town, and is bordered by rocks extending about a cable from the shore. The coast from thence trends north-westward for 5 miles to Zeitún point, which forms the eastern angle of the broad promontory of which cape Ierós is the western.

Cape Ierós.—From Kalmek point the coast bends to the south-west and then takes a north-west direction for 14 miles to cape Ierós, which forms a useful landmark for vessels bound to Trebizon, as it projects to the northward, and has several white patches in its vicinity. Its shores are irregular, of a reddish tint, and a conical hill rises at its extremity.

ZEITÚN POINT.—Anchorage.—Westward of cape Ierós the coast trends to south-westward, and thence north-westward to another Zeitún point, which bears W. by S. $\frac{1}{4}$ S., $10\frac{1}{2}$ miles from cape Ierós, forming a bay in which there is good anchorage abreast of Cheshmeh rivulet, sheltered from West round by south to E. by N.

Koureli and Kara Points.—Koureli point is a low projection of the coast distant 2 miles W. by N. of Zeitún point. Kara point is also low, and lies 10 miles westward of Koureli point.

TEREBOLÍ (TRIPOLI).—This town stands on three small points, which form two coves at $5\frac{1}{2}$ miles W.S.W. of Kara point. It has a population of about 3,000 persons. The western cove is full of rocks, but the other carries a depth of 3 fathoms and will contain 5 or 6 coasters. It is, however, exposed to northerly winds. The best anchorage is in the

* See Admiralty plan of Platana, on plans of ports and anchorages on south shore of the Black sea, No. 2,220; scale, $m = 2\cdot 5$ inches.

population is about 40,000. A public hospital has recently been erected and a British Vice-Consul resides here.*

Kalmek Point, is the north-west extremity of the anchorage of Trebizond, and affords protection from westerly winds; rocks extends off it to the northward about one-third of a cable. A battery and other buildings stand on the point.

LIGHT.—From a white tower, 20 feet high, between two embrasures of the battery on Kalmek point, is exhibited at an elevation of 105 feet, a *revolving* white light, which attains its greatest brilliancy *every minute*, and in clear weather should be visible from a distance of 16 miles.

Pier.—A pier, about 150 yards in length, extends in an E. $\frac{1}{2}$ S. direction from Kalmek point, and which affords loading and shelter to small craft. There is a depth of 9 feet about 20 yards eastward of the pier end, and beyond that distance a depth of 3 fathoms, sand and mud.

Communication.—There is constant communication with Constantinople, Odessa, and Poti, by vessels of the Russian Steam Navigation, and other companies.

Anchorage.—The roadstead is eastward of Kalmek point, and in strong westerly winds, only affords fair anchorage to small craft under the shelter of the pier.

The best anchorage is with Kalmek point bearing about W.N.W. half a mile distant, in from 5 to 7 fathoms, with good holding ground of mud and sand, and just clear to the eastward of some high land, which causes the land wind in fine nights to come off in strong gusts. It is advisable to moor with an open hawse to the northward, the anchors laid well apart, and a good hawser and stream anchor out astern. The wind is so variable here, coming off the land every night, that if the vessel swings she will be continually broadside to the swell, and run the risk from perpetual changes of loosening her anchors in the ground, besides the difficulty of keeping a clear hawse. She may hang by her stern anchor without any fear, and at the commencement of a gale from the N.W. the hawser can be veered to allow her to come head to wind. The breeze will soon be over, when it should be hove in again to keep the swell from the northward right ahead.†

Small vessels anchor in the bight of the bay close under Kalmek point,

* See Admiralty plan of Trebizond, on plans of ports and anchorages on south shore of the Black sea, No. 2,220; scale, $m=2\cdot5$ inches.

† H.M.S. *Sampson* in 1854, anchored in the road in 8 fathoms, with cape Ierós in sight, and at about $4\frac{1}{2}$ cables N. $\frac{3}{4}$ E. of the ruined castle in the bay; but the Consul recommended a berth more to the eastward, as with N.W. squalls the anchorage, on account of the swell, would be disagreeable.

and in from 2 to 4 fathoms, partly sheltered by the breakwater. The bottom of the bay is fronted by a beach.

Water.—To the eastward of Eleusa point near the ruined castle in the bay, there is another beach bordering the entrance of Dégermén valley. A rivulet runs into the sea here, over which is a stone bridge with several arches, from which vessels can complete their supply of water, by boats furnished with hoses.

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Cape Ierós.—From Kalmek point the coast bends to the south-west and then takes a north-west direction for 14 miles to cape Ierós, which forms a useful landmark for vessels bound to Trebizon, as it projects to the northward, and has several white patches in its vicinity. Its shores are irregular, of a reddish tint, and a conical hill rises at its extremity.

ZEITÚN POINT.—Anchorage.—Westward of cape Ierós the coast trends to south-westward, and thence north-westward to another Zeitún point, which bears W. by S. $\frac{1}{4}$ S., $10\frac{1}{2}$ miles from cape Ierós, forming a bay in which there is good anchorage abreast of Cheshmeh rivulet, sheltered from West round by south to E. by N.

Koureli and Kara Points.—Koureli point is a low projection of the coast distant 2 miles W. by N. of Zeitún point. Kara point is also low, and lies 10 miles westward of Koureli point.

TEREBOLÍ (TRIPOLI).—This town stands on three small points, which form two coves at $5\frac{1}{2}$ miles W.S.W. of Kara point. It has a population of about 3,000 persons. The western cove is full of rocks, but the other carries a depth of 3 fathoms and will contain 5 or 6 coasters. It is, however, exposed to northerly winds. The best anchorage is in the

* See Admiralty plan of Platana, on plans of ports and anchorages on south shore of the Black sea, No. 2,220; scale, $m = 2\cdot 5$ inches.

roadstead north-eastward of the town abreast of Khalka Vala beach, in from 8 to 10 fathoms.*

Fouroun Islets.—Two rocky islets, named Fouroun, lie abreast of a projection of the coast at 2 miles W.S.W. of Terebolí.

Zephyr Bay.—Cape Zephyros bears W. by S. 5 miles from Fouroun islets, and between them the coast falls back 2 miles to the southward, forming Zephyr bay. The anchorage is abreast of Zephyros village, which stands on its western shore, in from 5 to 10 fathoms, over sand and mud, and sheltered from N.W. round by south to E.N.E. Towards the cape, the shore is bordered by a rocky ledge which generally breaks.

KERASSOND (KERASOUNDA).—This town is situated 10 miles W.S.W. of cape Zephyros, on a flat promontory projecting to the northward from the foot of the mountains. It consists of 700 or 800 houses, inhabited by Turks, Greeks, and Armenians; the latter conduct the trade of the place amounting in 1882 to, imports 162,573*l.*, exports 185,274*l.*

Palamida Reef, lies a third of a mile off the northern face of the promontory, with cape St. Basli bears W. $\frac{3}{4}$ N., and the centre of Pouga islet, which lies nearly 2 miles eastward of Kerassonda, bearing E. $\frac{3}{4}$ S. It is not advisable to pass within half a mile of this reef. Between the reef and the town there is a depth of 12 fathoms.

From the western part of the promontory of Kerasounda, a reef projects in a south-westerly direction for a third of a mile.

LIGHTS.—Two *fixed* white lights placed vertically, the highest at 194 feet elevation, are shown from a mast on a white house situated on the north-east part of the point at Kerasounda; they are only visible 6 miles.

Anchorages.—Coasters anchor in Demir-kapí bight eastward of the promontory, at a little distance from the shore, in 12 or 13 fathoms water, sheltered from West and N.W., but exposed to northerly winds, when the surf is violent. There is better anchorage farther off shore in 16 fathoms, where one anchor will be sufficient.

At one mile to the eastward of Demir-kapí there is a projecting point bordered with rocks, to the eastward of which is Pugachik bight, where there is anchorage for coasters in 10 or 12 fathoms not far from the shore,

* "At Terebolí there are islets, and rocks awash; they lie north of the land distant more than half a mile from the coast, extending from east to west. North of the most westerly islet, distant one cable from it, is a dangerous shoal, covered by 5 feet of water."—Pola Hydrographic Notice No. 18, of 1880.

This vague statement may possibly refer to Fouroun islets.—*Ed.*

sheltered as at Demi-kapí from W. and N.W. winds, having Pouga islet a mile to the north-eastward, the additional shelter afforded by which, makes this bight a good winter anchorage for three or four coasters, if moored.

There is also anchorage in the bay close westward of Kerasounda point, named Lonja, or the Bazaar, in from 8 to 10 fathoms, but it is exposed to westerly winds, and with all its faults that of Demir-kapí is to be preferred. Vessels sometimes anchor in the roads to the westward of Lonja off the mouth of the river Batlama, in about 20 fathoms water.

Cape St. Basili is fringed by rocks, and lies 5 miles W. by N. of Kerasounda.

Shoal.—Along the coast westward of cape St. Basili, a shoal of 13 feet water has been reported, which in some parts extends more than one mile from the shore.

ORDOÚ.—The coast from cape St. Basili runs nearly in a direct line for 20 miles W. by N., with occasional beaches, as far as the town of Ordoú, which may be recognized by mount Bos Tepesi close north-westward of it, and which forms a promontory projecting to the north-eastward, between the beach of Melete-irmak and that of Pershembeh.

Anchorage.—The roadstead of Ordoú is good, with depths of from 10 to 5 fathoms, over mud and sand, sheltered from westerly winds, but exposed to those from between North and East.

VONA BAY.—At the north-eastern extremity of Bos Tepesi promontory, there is a steep rock named Bouzouk Kaleh, separating Ordoú and Pershembi bays. From Bouzouk Kaleh the coast trends westward and north-westward, forming Vona bay, to Vona point, which bears N.N.W. $\frac{1}{2}$ W., distant 6 miles from Bouzouk Kaleh. Vona bay affords the best anchorages on this coast; though exposed to winds from North to E.S.E., little is to be feared from them as they rarely blow home. The land winds, however, are violent, and must be guarded against. Most of the vessels belonging to the Anatolian coast, having to winter in the Black sea, resort to this bay, and there are sometimes 300 at anchor in it.*

Light.—A *fixed* white light is exhibited from a position 54 yards from the extremity of Vona point, at an elevation of 131 feet above the sea, and should be visible in clear weather from a distance of 12 miles.

* See Admiralty plan of Vona bay, on plans of ports and anchorages on the south shore of the Black sea, No. 2,220; scale, $m = 2\cdot 5$ inches.

Anchorages.—In the southern part of Vona bay there is anchorage in Pershembi bight, which is rendered conspicuous by an extensive beach bordering the shore between it and Bouzouk Kaleh. At 3 cables from the shore, there is a depth of 5 fathoms, sand and shells, which gradually increases to 20 fathoms at half a mile from the coast, over a bottom of sand mixed with mud. The anchorages, however, abreast of Agsi, $2\frac{1}{2}$ miles northward of Pershembi; of Keshalah, three-quarters of a mile to the northward of Agsi, and Chesmeh, $1\frac{1}{4}$ miles southward of Vona point, are much to be preferred; that off Chesmeh is considered the best. A quarter of a mile from the shore the depth is 10 fathoms, over sand and mud, with a good holding ground.

CAPE YASOÚN bears W. by N. $\frac{1}{2}$ N. $5\frac{1}{4}$ miles from Vona point, and between them the coast falls back one mile to the southward, affording an anchorage sheltered from East (through south) and West winds. The cape is low and projects to the northward in the form of a glacis, with a monastery on it. Khanet Kalessi, a small islet, with a tower, lies near the shore 2 miles westward of Vona point.

Fatsa Bay and Reef.—From cape Yasoún the coast turns abruptly S.W. by S. for $6\frac{1}{2}$ miles, and then curves round to the westward to Karejik point, which is $10\frac{1}{2}$ miles W.S.W. of the cape, forming Fatsa bay, which takes its name from the small town on the western shore. Fatsa reef lies one mile eastward of Karejik point, and is about 6 cables in extent, with 12 fathoms to the northward of it. Few vessels frequent this bay, as it is open to the northward, and deep, having from 13 to 30 fathoms close to the shore.*

OUNIEH (Uniah).—This town (ancient Cenoe) is built in the shape of an amphitheatre, on the eastern declivity of Tashkaná point, which bears nearly due West, distant 17 miles from cape Yasoún. It stands on the western shore of Ounieh bay, and has a handsome appearance, being backed by a range of wooded mountains. The houses are chiefly of wood, and those nearest the sea are erected on stone piers or pillars. The population is composed mostly of Greeks, who carry on a considerable traffic with Constantinople and the Crimea.†

Tashkaná Point is bordered by a reef, which extends about one cable from the shore. About half a mile westward of Tashkaná point, and close to the shore, there is a small islet, with a church on it dedicated to St. Nikoló.

* See Admiralty chart:—Kerempeh to cape Yasoún, No. 2,237; scale, $m = 0\cdot17$ inches.

† See Admiralty plan of Ounieh bay, on plans of Turkish ports on the south shore of the Black sea, No. 2,216, scale $m = 2\cdot5$ inches.

Anchorage.—The anchorage abreast of the town is in 5 or 6 fathoms, mud and sand, about three-quarters of a mile from the shore. The depths from this position decrease gradually to the town, over a sandy bottom. A vessel should moor with open hawse to the N.E., as the winds from that quarter are dangerous.

Chaldi Point.—Anchorage.—From Tashkaná point the shore becomes low and wooded, trending westward and northward to Chaldi point, which lies 16 miles N.W. by W. There is good anchorage, in 4 or 5 fathoms over a mud bottom, abreast of the river Termeh, which falls into the sea nearly 4 miles to the southward of Chaldi point, but it is exposed to N.E. winds.

Iris Point (Tchiva Burnu).—The coast from Chaldi point still continues low and wooded, trending 17 miles W. by N. $\frac{1}{2}$ N. to Iris point; from thence it turns southward and westward to Kalion point, which lies W. by S. $13\frac{1}{2}$ miles from Iris point, and forms Samsoún bay. The river Yeshil Irmak (ancient Iris) falls into the sea 3 miles south-westward of Iris point.

LIGHT.—Two lights, fixed *red*, are exhibited from the extremity of Iris (Tchiva) point; the upper light is elevated 49 feet above the sea, and should be visible in clear weather from a distance of 8 miles.

Shoals.—Between Chaldi and Iris points there are shoals, some of which are reported to extend more than $1\frac{1}{2}$ cables from the shore; and at the distance of about a mile from the coast the depths are variable, with not more than $3\frac{1}{4}$ to $3\frac{3}{4}$ fathoms in some places.

SAMSOÚN.—The town of Samsoún (ancient Amisus) is small and unhealthy, and is situated on the western shore of the bay nearly one mile to the southward of Kalion point, a low projection, remarkable for its brownish appearance. A battery stands on Kalion point, and to the westward may be seen two conical summits of the Nebiene mountains. The point is bordered by sunken rocks, or the remains of a mole, extending nearly 3 cables off shore, on which the sea breaks heavily at times; there are also several rocks along the shore bordering the town, which makes it sometimes in rough weather dangerous for boats to approach it, but towards the battery southward of the town the shore is clean.

LIGHT.—A *fixed* white light is shown from Kalion point, at 133 yards N. by W. $\frac{1}{4}$ W. from the battery; it is 56 feet high, and visible 10 miles.

Anchorage.—Vessels anchor abreast of the town in any convenient depth, as there are 3 fathoms, sand, at a quarter of a mile, and 6 fathoms, mud, at three-quarters of a mile from the shore; but this anchorage is

only good in summer, as northerly and north-easterly winds make it dangerous during the winter months. A heavy swell generally sets in, which renders it difficult to ship and land goods; yet it is done in a very expeditious manner, and a flourishing trade exists, amounting in 1882, exports and imports, to 1,069,056*l.* A British Vice-Consul resides here.*

Koúmjougaz Road.—From Kalion point westward there is a long beach, followed by low lands covered with trees, trending N.W. $\frac{1}{2}$ N. for 14 miles, to the roadstead of Koúmjougaz, which is well spoken of, and lies abreast of the mouth of a large lake. There is a depth of 5 and 6 fathoms over a muddy bottom from one to $1\frac{1}{2}$ miles from the shore, but the anchorage is exposed to winds from North to E.S.E. All this coast is clean, having a depth of 10 fathoms at from $1\frac{1}{2}$ to 3 miles from it.

HALYS POINT (CAPE BAFRA).—Injer point lies 7 miles due north of Koúmjougaz, and from thence the coast trends N.W. $\frac{1}{2}$ N. for 11 miles to Halys point or cape Bafra, which is low and covered with trees, and where the river Kizil Irmak (ancient Halys) falls into the sea by two mouths, forming an islet between them.

LIGHTS.—At Halys point, on the northern extremity of the islet between the mouths of Kizil Irmak river, two *fixed* white lights, placed vertically, are exhibited. The upper light is elevated 49 feet above the sea, and should be visible in clear weather from a distance of 10 miles.

The Coast.—Westward of Halys point, the coast trends west south-westward for 18 miles, and is low and wooded, thence in a north-west direction, the coast is bordered by mountains as far as cape Sinoúb; the bay between which is 39 miles across in a N.W. by W. $\frac{1}{4}$ W. direction, is 13 miles deep, and in the north-west corner lies the town of Sinoúb.

GHERZEH.—This little town (ancient Carusa) stands on a low point at the foot of a high mountain, about 13 miles southward of Sinoúb. A reef extends about one cable E.S.E. of the point; rocks also border the shore of the town, to the distance of half a cable.

Anchorage.—The anchorage in this roadstead is said to be safe in from 5 to 7 fathoms, mud and sand, about 4 cables from the shore. A small vessel anchored in 3 fathoms, mud and shells, at about 2 cables southward of the town will be sheltered by the point from N. and N.E. winds.†

* See Admiralty plan of Samsoún bay, on plans of Turkish ports on the south shore of the Black sea, No. 2,216; scale, $m = 2\cdot 5$ inches.

† See Admiralty plan of Gherzeh, on plans of Turkish ports on the south shore of the Black sea, No. 2,216; scale, $m = 2\cdot 5$ inches.

CAPE SINOÚB is the north-east extremity of the peninsula of Boztepeh (about 6 miles in circumference), which projects about 3 miles to the eastward from a narrow isthmus connecting it with the main land, and on which stands the town of Sinoúb (ancient Sinope). In whatever direction the cape is approached, it may be easily recognized by the peculiar form of the peninsula, the summit of which is flat and the sides steep, except towards the isthmus. The isthmus is scarcely visible from a distance, so that the peninsula will make as an island.

Boztepeh Point.—A conspicuous rock lies about $1\frac{1}{2}$ cables E.N.E. of Boztepeh point, the south-eastern extreme of the peninsula. The rock is steep-to, with from 14 to 19 fathoms water between it and the point. The northern shores of the peninsula are clean, but a vessel in running or turning to windward along the southern shore must not approach within one cable.

The only landing place on the south side of the peninsula is at the ravine below the village of Ada Kioi, just westward of the battery.

LIGHT.—A *fixed* light is exhibited from a white stone tower on Boztepeh point, half way up the cliff, at an elevation of 344 feet, and should be visible in clear weather from a distance of 12 miles.

SINOÚB (SINOPE).—This town, formerly the capital of Pontus, is divided into two distinct parts. The first is the fortress, built on the isthmus, and inhabited by Turks, the walls of which are washed by the sea. The second stands on the slope of the peninsula, and is the residence of the Christians, composed mostly of Greeks. It has a population of from 8,000 to 10,000, many of whom are employed in the dockyards, where several of the finest ships in the Turkish navy have been built, and where merchant vessels can be repaired. The Governor of the district resides here.*

Communication.—There is steam communication by French, Austrian, and Turkish steamers, with Constantinople, and the various ports on this coast.

Anchorage.—The roadstead enjoys a good reputation even in winter, and is the safest anchorage between the Bosporus and Batoum. Vessels anchor in from 5 to 10 fathoms, mud and sand, from 2 to 4 cables southward of the town, quite sheltered from westerly and north-easterly gales.

* See Admiralty plan of Sinoúb, on plans of Turkish ports, &c., No. 2,216; scale, m = 2·5 inches.

The shore can be approached to the depth of 3 fathoms, but off the town the bottom is foul with the remains of ancient jetties.*

Current.—Near Sinoúb, the effects of a current running westerly as far as cape Kerempeh have been experienced, extending only a short distance from the shore, but at a greater distance to seaward it sets to the eastward.

AK LIMAN.—This little port (ancient Armene) lies 5 miles W.N.W. of Sinoúb, at the extremity of a low and sandy shore, which is backed by mountains bordered by white rocks. It is about half a mile in depth from east to west, and the same in its widest part from north to south, but the entrance is narrowed to a quarter of a mile by two islets which lie off the points. That to the northward is bordered by rocks, but the southern islet has a depth of 3 fathoms close to it. The port which is open to the eastward, has from 7 to 5 fathoms at a little distance within the entrance; nearer the bottom of the port there is a depth of 2 and 3 fathoms, which will accommodate vessels of light draught, sheltered in the northern part from all sea winds, with 2 fathoms water at $1\frac{1}{2}$ cables from the shore. There is a landing place on the southern shore.†

Coast.—Reef.—Beyond Ak-Liman the coast becomes bold and rocky, and trends N.N.W. for 3 miles, forming three points, the northern of which is Pakhios point. About one mile north of Ak-Liman, is a reef at half a mile distant from the shore. From Pakhios point the coast trends westward to cape Injeh, which is distant 3 miles.

CAPE INJEH and Pakhios point are the most northern points of Anatolia. They are of a reddish tint, and free from danger. The cape is flat, and resembles a bastion.

LIGHT.—From a white stone tower erected on cape Injeh, is exhibited at an elevation of 92 feet, a *fixed* white light with a *flash* *every minute*, and should be visible in clear weather from a distance of 13 miles.

Weather.—Capes Injeh and Sinoúb form a remarkable feature of the coast, dividing the eastern and western parts of Anatolia. It has been before stated that the westerly winds are the most dangerous on the eastern part of this coast, and that North and N.E. winds do not reach it. Easterly winds also are always light. Fogs are rare, and the temperature

* This is a good and safe anchorage, and 20 sail of the line might find good berths, and ride here, both winter and summer.—Remark Book of Captain L. Jones, H.M.S. *Sampson*, 1854.

† See Admiralty plan of Ak-Liman, on plans of Turkish ports, &c., No. 2,216; scale, $m = 2\frac{1}{2}$ inches.

of the atmosphere so mild that the olive and orange trees grow luxuriantly. The western part as far as the Bosporus, on the contrary, is cold and chilly, and the winds from West to north and N.E. are accompanied by winds of hurricane force, which occasion numerous shipwrecks and loss of life.

Kuildi Reef.—From cape Injeh the coast turns abruptly to the southward and south-westward, whence it takes a westerly direction to cape Kerempeh, which bears West, 75 miles from the former cape. A bed of rocks, named Kuildi reef, lies S.W. $\frac{3}{4}$ W. 13 miles from cape Injeh, and is about 2 miles in length from east to west, a good half mile in breadth, and its outer edge is about a mile from the coast. Its eastern end is off the valley of Kaza-kildi, which is covered with buildings, and another inhabited valley is nearly abreast of the shoal.

Stephano Point.—Anchorage.—Stephano point is a small projection of the coast, lying W. by S. $\frac{1}{4}$ S., 21 miles from cape Injeh. There is anchorage abreast of the town which stands eastward of the point, sheltered from West and N.W. winds, but open to the N.E. The depths are from 3 to 5 fathoms, sand and mud.

Antonios Point.—Anchorage.—St. Antonios point is situated $6\frac{1}{2}$ miles W. by S. of Stephano point. There are some buildings and a rivulet eastward of the point.

The anchorage is to the eastward of the rivulet in 3 or 4 fathoms, mud and sand, but it is exposed to all winds from seaward.

Apana.—From Antonios point the coast takes a westerly direction for 8 miles to Kinogly point, off which rocks extend to the north-eastward; thence the coast continues in the same direction to Apana, a distance of 8 miles, off which coasters sometimes anchor, abreast of the village and rivulet.

INEBOLI (NIOPOLI).—Ineboli point is situated $11\frac{1}{2}$ miles westward of Apana. This projecting point which is low, and off which a reef extends some distance, forms a roadstead to the eastward, abreast of the little town of Ineboli which stands on its southern shore, where vessels anchor in 3 or 4 fathoms, muddy bottom.

LIGHTS.—Two *fixed* lights, placed vertically, are exhibited from a mast on Ineboli point; the highest at 84 feet elevation; and are visible about 4 miles.

CAPE KEREMPEH, situated 22 miles W. by N. of Ineboli, is the western termination of the most prominent land of the Anatolian coast, of which Sinoúb is the extreme east. This cape, one of the highest in the Black sea, is bordered by reddish cliffs, and may be easily recognized by

vessels coming from the Krimea, from which it is distant 140 miles. These two promontories divide the Black sea into two parts, the eastern and western, which are often very distinct, by the different winds blowing at the same time in each. Cape Kerempeh deserves the name of Spartivento (Separator of Winds), which has been given by the Italians to several capes in the Mediterranean; for a strife between the winds is often observed abreast of it. It is much dreaded by the coasters, from the severe tempests which often occur in its vicinity.*

Kara-Agatch.—From cape Kerempeh the coast is safe to approach; it trends in a west-south-west direction for 93 miles to cape Babá.

The village of Kara-Agatch lies 14 miles from the former cape, where vessels of considerable size are built. The anchorage, which is exposed to westerly winds, is only used by coasters. Fulo mountain lies $3\frac{1}{2}$ miles to the south-eastward.

Kidros.—The little port of Kidros is $5\frac{1}{2}$ miles westward of Kara-Agatch; and is backed by a mountain in the form of a sugar-loaf, which assists in identifying it. The port will accommodate 5 or 6 vessels, in from 3 to 4 fathoms, but exposed to northerly winds. In entering, keep the eastern shore aboard, to avoid a rock which obstructs and considerably narrows the entrance.

AMÁSTRA.—Amástra bay is 23 miles to the westward of Kidros, and is formed between Chakras and the town of Amástra (ancient Amastris), which appears at a distance like a group of islets. The town stands on a double peninsula, the eastern part of which is a quarter of a mile in length from east to west, connected with the main land by a low sandy isthmus of about two-thirds of a cable in breadth. The western part is joined to the eastern by a narrow bar, over which the sea breaks in heavy weather, and northward of which is a shoal close to the shore. At one cable northward of the eastern peninsula, there is an islet 340 yards in length from north to south of moderate height, and with bold yellow shores; between it and the town there is a depth of 10 fathoms.†

LIGHT.—From a stone tower on the summit of the peninsula of Amástra is exhibited at an elevation of 312 feet above the sea, a *flashing* white light, showing a flash every *ten seconds*, and visible in clear weather from a distance of 16 miles.

Anchorages.—The best anchorage, about 3 cables in extent, is that south-eastward of the town, abreast of the isthmus, in from 8 to 3 fathoms

* See Admiralty chart:—Bosporus to Kerempeh, No. 2,238; scale, $m = 0\cdot18$ inches.

* See Admiralty plan of Amástra, on plans of Turkish ports, &c., No. 2,216; scale $m = 2\cdot5$ inches.

sandy bottom, protected to the northward by an islet, which is connected to the peninsula by rocks. A reef extends one cable eastward of the point of the islet, which serves to break the force of the sea with northerly winds.

On the southern shore of this anchorage, off two points, distant 3 and 5 cables eastward of the peninsula, shoals extend for the distance of one cable, and are said to be the remains of ancient jetties.

The eastern portion of Amâstra bay is clean, having from 4 to 10 fathoms close to the shore, over sand and mud.

A cove, one cable in extent, lies westward of the isthmus, but the anchorage is inferior to the eastern one, and exposed to westerly winds. The entrance, one cable in breadth, is much narrowed by rocks which fringe the northern and southern shores. It has from 8 to 2 fathoms over a sandy bottom. The commerce of this place is inconsiderable.

Bartheni (Bartheni).—The river Bartheni reaches the sea $7\frac{1}{2}$ miles to the westward of Amâstra, and near a point of the same name. There is a depth of 3 fathoms near the shore, and 8 feet on the sand bar at the mouth of the river, the channel over which is narrowed by rocks on both sides. The river is available for coasters to Bartheni, which is situated 2 miles from the mouth of the river.

The Coast.—Ghizeljeh Hissar is a slight projection of the coast 4 miles south-westward of Bartheni point, and between it and Philios point, which lies nearly 8 miles further on, there is a beach 6 miles in length. Kilimoli point, which projects a little from the coast, is high, and lies 4 miles to the westward of Philios point, the coast between them receding slightly to the westward.

KOSLÚ BAY.—The locality of Koslú bay, which lies about 12 miles south-westward of Kilimoli point, is best distinguished by the houses near the shore, there being no similar settlement upon the whole coast between Bender Erekli and Amâstra. The land about it presents no remarkable object, the coast being generally bordered by high mountains covered with forests.*

Anchorage.—The bay affords a summer anchorage for steamers and coasters. Traders resort to it in May and later, for the shipment of coal, anchoring north-eastward of the valley, so as to get better shelter from the point, the wind being generally to the eastward of N.E. The bottom is sand, under the depth of 12 fathoms, with mud and sand in deeper water. The western extreme of the land kept open of Alessio, will lead to a good

* See Admiralty plan of Koslú bay, No. 2,294; scale, $m=4\frac{1}{2}$ inches. From remarks by Commander Spratt, H.M.S. *Spifire*, 1854.

berth at a quarter of a mile from the shore; but to expedite the embarkation of coal a nearer berth may be taken. During the month of May the coast is sometimes visited with a gale from the N.N.E., which on one occasion caused the wreck of 8 or 9 vessels; but during the months of June, July, August, and September it is said to be perfectly safe.

COAL.—Commander Spratt also remarks:—“The chief locality for good coal is at the valley of Koslú, where the Turkish government have an establishment under the direction of two civil engineers. There are nine seams of coal, but only four at present worked, which, with the present means at the command of the engineer, will supply 2,500 tons per month. The thickest of these seams is 18 feet, and the least about 3 feet. A tramroad leads from all these mines to the shore; the extremity being carried out upon the east point of the bay, to enable boats to lie under 8 or 9 shoots, and receive the coal direct from the trucks. According to the statement of the engineer, 300 tons can be shipped per day, weather permitting. Some of the mines penetrate 300 or 400 yards into the mountain.

“The coal of three heaps now lying in the valley have a close resemblance to each other, and in the furnace, either for steaming or economy, have no appreciable difference, the whole being very like Newcastle coal in weight and appearance also.”

BENDER EREKLÍ BAY.—Cape Babá.—From Koslú bay the coast trends 17 miles S.W. by W. $\frac{1}{4}$ W. to the promontory of cape Babá, which is faced with rocky cliffs, and rendered remarkable by the sudden change in the aspect of the coast southward of it. South-eastward of the cape is the bay of Bender Ereklí.*

LIGHT.—A light tower about 60 feet high stands on the summit of cape Babá, and being white is conspicuous. It is said to be only lighted occasionally, and then exhibits a *fixed* white light, at 656 feet above the sea, which may be seen in clear weather at the distance of 8 miles.

TOWN.—The town (ancient Heraclea) stands on the north-east shore of the bay, three-quarters of a mile eastward of cape Babá, and was formerly of considerable extent; there was a castle and a mole, both of which are now in ruins. The remains of the ancient mole is about $1\frac{1}{2}$ cables in length, and extends in a S.S.W. direction from a 6-gun battery which stands on the shore, about three-quarters of a mile E.S.E. of cape Babá.

The bay of Bender Ereklí, is about $2\frac{1}{2}$ miles in length from cape Babá to

* See Admiralty plan of Bender Ereklí, No. 2,387; scale, $m = 4\cdot 5$ inches. From remarks by Commander Spratt, H.M.S. *Spitfire*, 1854.

Kara Sakal, its southern point, with a depth in the middle of 7 fathoms, over sand and mud, gradually shoaling to the shore.

Anchorage.—There is a depth of 4 fathoms at 2 cables south-eastward of the mole, at one cable from the shore, where small vessels may anchor, sheltered from W.N.W. round by north to S. by W.; but the anchorage north-west of the mole, between the town and cape Babá, is to be preferred, where small vessels may lie sheltered from westerly winds in 3 or 4 fathoms, over mud and sand. The S.W. winds are not dangerous, as they seem not to blow home, and the coast not being far off in that direction, the fetch of the sea is not great. The anchorage for larger vessels is in about 6 fathoms, at 4 cables E.S.E. of the cape.

The bottom in Bender Erekli bay is clay and sand, affording good holding ground, but it is not a safe anchorage against a W. or N.W. gale, unless a vessel is anchored well up in the bay, between cape Babá and the ancient mole, so as to obtain some shelter from those winds. Country vessels lie moored head and stern here during the whole winter, and are said to be perfectly safe from every gale, although exposed to some fetch from the S.W.

Coal.—A seam was opened by the Turkish government in 1854, about 9 miles from Bender Erekli; producing as good coal as that obtained from Koslu valley. During the year 1853, 50,000 tons of coal were exported from this district. Caiques are employed during the winter, when the weather permits, to bring coal to this bay from all the valleys where it is piled.

COAST.—Kefken or Kirpen point, bears due West 52 miles from cape Babá, and between them the coast falls back 12 miles to the southward, forming a deep bay. Westward of the Melen Sou, which flows into the sea, 24 miles S.W. by W. $\frac{1}{2}$ W. of cape Babá, the coast is backed by mountains, and fronted by a beach 27 miles in length, which terminates at Chalbi point, where the mountains again border the shore.

Sakárieh (Sargonius) River.—The mouth of the river Sakárieh is 13 miles to the westward of Melen Sou. There is a depth of from 3 to 5 feet on the bar, whence the river has a depth of 3 fathoms for distance of 8 miles, with an average breadth of about 90 yards.

Kirpen Point.—Remarks.—From a position 10 miles northward of Kirpen point, you may see in clear weather Mount Agvah, a high peaked mountain some distance to the westward and 5 miles from the coast, bearing about S.W.; and an isolated peak nearly over the two peaks of mount Kandra, (which are about 700 feet high and covered with trees,)

S. by W. $\frac{1}{4}$ W., backing the anchorage of Kirpeh; also Kirpeh island lighthouse when within the range of it. These observations may be useful, as the land in the vicinity of the point is said by some mariners to resemble the entrance of the Bosphorus, but can scarcely be mistaken for it, since the beacons have been erected on both sides of the entrance.

KIRPEN ISLAND is low, of about 2 cables in extent, and lies about 2 cables northward of Kirpen point, with a small islet close westward of it. From seaward, the masts of vessels in the anchorage can be seen over the island.

Shoal.—Shoal ground extends for a distance of 250 yards westward of the lighthouse on Kirpen island.

LIGHT.—Two *fixed*, white lights, placed vertically, are exhibited 65 yards from the western extremity of Kirpen island. The upper light is elevated 91 feet above the sea, and should be visible in clear weather from a distance of 10 miles.

Kefken Bay is formed between Kirpen point and a point 2 miles west-south-westward of it.

Shoals.—A rock above water lies close eastward of the south-west point of the bay; and Kirpen shoal at about 5 cables E. by N. $\frac{1}{2}$ N. of the same point, and one mile S.W. $\frac{1}{2}$ W. of Kirpen point.

Anchorage.—The islands and point are safe to approach, avoiding the shoal extending one cable westward of the shore of the lighthouse, and vessels anchor near Kirpen point, protected by the islets from northerly and easterly winds, in from 6 to 7 fathoms water. About one mile south-west of Kefken bay is an inlet named False Kefken, but it is not used.

Kerneh and Kirpeh Bays lie about 2 miles southward of Kefken bay, and has a depth of from 3 to 4 fathoms. It affords shelter from the northward, and small craft protect themselves under a low point from westerly winds. A bold headland separates Kerneh bay from Kirpeh bay to the south-westward, which is about three-quarters of a mile in length from east to west, and much preferred to the preceding ones. In rounding the northern headland, give it a wide berth to avoid the rocks which lie to the southward of it, and anchor in 7 to 8 fathoms, sheltered from North and N.W. winds, and exposed only to the westward.

Bashna island, 4 miles westward of Kirpeh bay, has a tower on it.

KILIA (SHILLI).—From Kirpeh bay the coast trends W. $\frac{1}{2}$ N. for 26 miles to Kilia point, which slopes gradually towards the sea, terminating in a little chain of islands evidently forming at one time a portion of it. The place to a stranger would seem to offer shelter in a N.E. gale, as the cluster of islets appear to form a natural breakwater, but the sea

rushes between them at such times with great fury, and would render any attempt to ride out a gale extremely hazardous, more especially as the islets are surrounded by foul ground and the water shoals rapidly in the bay.

The town of Kilia or Shilli, built on the top of the point, is of considerable size, and exports large quantities of charcoal, and stones for building purposes; the small craft engaged in the trade of which have to be drawn upon shore to receive their cargoes, and await a favourable opportunity for the return voyage to Constantinople.

There is telegraphic communication with Constantinople.

Seamark.—On the summit of the largest of the islets stands an old square tower, once part of an extensive castle, the ruins of which lie all round. The whole of the sea face of this ruin has been painted white, and is seen in clear weather at a great distance in all directions seaward.*

LIGHT.—From a lighthouse, coloured light red, on the rising ground at Kilia point, is exhibited at an elevation of 210 feet above the sea, a white light which revolves *every minute*, and should be visible in clear weather, from a distance of 20 miles.

Lifeboat.—A lifeboat and rocket station is established in the bay westward of the lighthouse, where also is a white tower.

Maara-burnu Beacon.—From the west end of Kilia bay, a range of hills extend along the shore as far as Maara-burnu, a distance of 5 miles, on the summit of which projection is beacon No. VIII., coloured red and surmounted by a ball over a triangle; a few yards below this beacon on the western slope is the mouth of a remarkable cave, which has given its name to the place: this cave runs a long distance inland, though the passage is very small and not sufficient to admit a man in an upright position.

Rocket Station.—Midway between Maara and Alladjelli beacons, is a rocket station, painted white.

Alladjelli Beacon.—From Maara-burnu the hills recede about $1\frac{1}{2}$ miles from the shore, having a low sandy piece of land at their foot, which about half way between Maara and Kara-burnu stretches slightly into the sea, forming the sandy point of Alladjelli, on which has been placed beacon No. VII. which is triangular, surmounted by two balls, and coloured red.

Coast.—The sandy coast terminates at Armankiang, within $1\frac{1}{2}$ miles of Kara-burnu, where there are a few chalk cliffs, from the top of which the ground rises gradually to the summit of the range of hills of which Kara-burnu is the termination of a spur.

* See also Admiralty chart:—sea of Marmara, No. 224; scale, $m=0\cdot27$ inches.

Between Shilli and Kara-burnu the shore is fringed with reefs, and should not be approached within one mile, as under that distance the water shoals rapidly.

KARA-BURNU.—Landmarks.—Beacon.—Kara-burnu slopes and narrows gradually as it stretches into the sea, but near its termination suddenly rises and swells out, forming a mound, which has a curious appearance, as, the earth having been washed away from the top, the boulders of which it is principally comprised stand up like the stones of a cemetery. The sea face of this mass of boulders has been painted white, as well as a cliff of greater elevation a few yards eastward of the point, and thus from the northward two patches are seen; in other directions only one. Foul ground extends around the point to the distance of one cable.

Beacon No. VI., painted red, triangular, and surmounted by a ball, stands on rising ground overlooking the mound; a few yards west of it is a rocket station, painted white, as are all the rescue stations on the Asiatic side of the Bosphorus.

Coast.—The country between Kara-burnu and Riva shows no sign of cultivation or of inhabitants, the nearest village being several miles inland; it is thickly covered with brushwood, arbutus, and other shrubs. A short distance westward of Kara-burnu, however, there is a small collection of huts named Mariola, where during the summer months a fishery is carried on, but which in the winter is deserted.

Adajiklar-burnu.—Beacon.—From Mariola, cliffs of a yellow colour extend along the shore, with occasionally a small valley, at the mouth of which is generally a narrow slip of beach. Adajiklar-burnu, one of the principal of these cliffs projects somewhat from the shore, about 4 miles west of Kara-burnu. On the summit of this point is beacon No. V., painted red, with staff, surmounted by a ball over a triangle, and close to it on the side of the hill is a rocket station.

Gelara-burnu.—Landmarks.—The next projecting point westward, is long and sloping; it terminates in a rock separated from the land by a narrow passage of a few yards in width, but which rock, not being of greater elevation than the point, has not the slightest resemblance to Kara-burnu. On the point stands beacon No. IV., triangular, painted red, surmounted by a ball on a diamond. The three faces of the point have been painted white as a distinguishing mark, seen in all directions seaward.

Rocket Station.—A rocket station is established near the beacon.

Khair-sis Islet.—Good for nothing islet, as this name implies, lies about half a mile eastward of Elmas Tabia point, and is surrounded by reefs; it should not be approached within half a mile. There is deed

water between it and the shore, though the channel is narrow on account of foul ground lying off the islet. The islet is high, rises abruptly from the sea, and consists of two portions, connected in the centre by a low ridge. On the northern and larger portion stands beacon No. III., which is triangular, surmounted by two balls, and painted red; the cliffs underneath have been whitened, presenting a mark seen in all directions from seaward.

Elmas Tabia-burnu.—This place, so named from the existence of a military station, is a bold headland and steep-to. It is the termination of a range of hills that stretch away inland, forming the east side of the valley of Riva, through which runs the little river of the same name, reaching the sea at the foot and to the westward of the headland.

Riva (Irva).—The river is navigable for large boats to a considerable distance in the interior, and large quantities of charcoal and firewood are exported to Constantinople by means of it. The passage over the bar, however, being only open during the winter, the cargoes have in summer to be transhipped, which has necessitated the building of the village of Riva as a small seaport and home for the sailors engaged in this traffic.

There is an old castle standing at the mouth of the river, in which are mounted a few pieces of artillery, so that it is probable the traffic on the river was formerly considerable, and the place of more importance.

Anchorage.—There is anchorage in 4 fathoms half a mile westward of the village, shoaling quickly towards the shore.

Lifeboat.—Rocket Station.—There is a lifeboat station at the entrance to the river, and a rocket station on Elmas Tabia-burnu.

Coast.—From the mouth of the Riva a long beach commences, which extends westward along the shore of the shallow bay, terminating in Youm-burnu. This beach should not be approached with one mile, as the water shoals rapidly.

Sowak is an islet lying in the depth of the bay, connected to the beach by a sandy spit. It is of considerable elevation, and shelters the few huts built on the shore, where a fishery is carried on during the summer months.

Sowakdéré.—Beacon.—Near the termination of the beach, and where a stream reaches the sea, is beacon No. II., triangular, with staff and ball, and painted red. This is the best point to beach a disabled vessel unable to weather Youm-burnu. There is a storehouse near the beacon for rocket gear.

YOUN-BURNU is a bold headland, steep-to, and so much more elevated than the land in the vicinity, that the lighthouse on cape Anatoli is not seen when approaching the entrance on a course more westerly than

S.W. by W. ; vessels from the eastward should accordingly be careful not to alter their course to the southward in thick weather, or in dark nights, until both lights at the Bosphorus are in sight, as at those times, Elmas Tabia point may be taken for Youm-burnu, and the vessel thereby placed in danger.

Beacon.—Beacon No. I., triangular, with staff and ball, and painted red, is placed on the top of the cliff, and underneath, the cliffs are whitewashed, showing a mark in all directions seaward for 15 miles ; it sometimes appears double from a division in the marking.

Fog Signals.—Two guns are fired in quick succession from Youm-burnu, *five minutes* after the fog signal gun from Roumili Kalessi has been heard, which gun is fired during thick or foggy weather, or whenever the light of Anatoli cannot be seen from that of Roumili, every *twenty minutes*.

Rocket Station.—A rocket station is established on Youm-burnu.

CAPE ANATOLI LIGHT.—From a white stone tower 65 feet high on cape Anatoli, is exhibited at an elevation of 249 feet above the sea, a revolving light, which shows one *red* and two *white* flashes every *two minutes*, and should be visible in clear weather from a distance of 20 miles, but is seldom seen at that distance ; the eclipses are not total.

GENERAL DIRECTIONS.—Before finishing this work it will be necessary to give directions for making the Bosphorus when returning from the Black sea.

On approaching the Bosphorus from the northward, in clear weather the land about the entrance is easily recognized by the peculiar outlines of the hills of Maltepeh and the Brothers, which tower far above the intervening ranges on the Anatolian coast, whilst the outlines of the Roumelian hills run along for miles at an apparently uniform height. On a nearer approach, the light vessel which is moored 15 miles N.N.E. $\frac{1}{2}$ E. of the Bosphorus will be seen, and when abreast the light vessel the whitewashed mark upon Youm-burnu appearing in two patches will serve to point out the position of the lighthouses which soon after become visible.

The red sandy patches about Kilius and to the westward, are next seen, as well as the whitewashed marks upon Khair-sis islet, and others to the eastward.

There is a marked difference between the two coasts in this vicinity ; as the Anatolian coast, from the entrance as far as Maara-burnu, where is beacon No. VIII., being principally fringed with broken cliffs, there is little or no beach visible until very close in with the land ; whilst on the Roumelian coast a long sandy beach commences from Kilius, and, running

away to the westward, is merely divided by Kara-burnu. From this beach the ground slopes gradually upwards, forming into a number of broad spurs, covered generally with sand of a reddish tint, so that at a considerable distance great patches are seen extending from the horizon to the top of the hills. These distinctive features of the shore well define the western side of the entrance of the Bosphorus, and which is further marked by beacons extending as far as 26 miles westward of the entrance, as well as by Kara-burnu lighthouse about 22 miles to the westward, and which is visible 27 miles in clear weather. In the same way the Anatolian coast will be known by the white marks under the beacons Nos. II., IV., and VI., by the lighthouse on Kili point, and by the absence of the sandy patches.

Fogs.—In time of fog, however, and during bad weather, when dense clouds hang about the hills in the background, and the driving rain renders everything obscure, great caution is necessary on approaching the coast, as at those times there are some localities that bear a strange resemblance to the entrance, and if the landmarks cannot be seen the lead must be resorted to, when, if proper care is taken, and due regard paid to the soundings, a good knowledge of the vessel's position can be arrived at, and the entrance steered for accordingly, when the fog signals from Roumili and Youm-burnu will probably be heard.

White Fogs.—These fogs come on at times with inconceivable rapidity during calm weather, enveloping everything with a thick white vapour, through which nothing is visible. As the mist, however, occasionally rises to the top of the cliffs, and sometimes clears away altogether for a few moments, the beacons have been erected with the view of affording by the glimpses thus caught of them a knowledge of the vessel's position, obviating the necessity of vexatious delay on the part of a steamer, and enabling a sailing vessel finding herself unexpectedly close to the shore to take all necessary precaution to avoid the danger.

From July to September is the period during which the white fogs are most frequently experienced, though they occur occasionally during the other months.

Soundings.—An inspection of the chart will show the great difference both in the depth of water and nature of the bottom on the bank of soundings off the respective shores. Westward of Kara-burnu on the Roumelian coast, the 100 fathoms bank extends to about 23 miles from the shore, and soundings are obtained before the land becomes visible. This distance decreases gradually towards the entrance, where it extends to about 15 miles.

The soundings on this bank gradually decrease towards the shore, the

bottom at first being oaze, which changes to mud and broken mussel shell when within an average distance of 7 miles from the shore; when within 3 miles, the bottom changes to shell, and at one mile from the shore to sand. Off Kara-burnu and to the westward, patches of oaze mixed with a soft yellow clay are found in the mud bank, giving a streaky appearance of blue and yellow to what is brought up by the lead.

Off the Anatolian coast, the 100 fathoms bank does not extend more than 10 miles from the shore; the soundings decrease more rapidly and the bottom is mud and small round shells, quite unlike the broken mussel shell of the western coast. The bank of shell also extends much farther from the shore, in some places as far as 5 miles, but changes to sand when within a mile, as on the other side.

Immediately off the entrance of the Bosphorus, the bottom at first is found to be similar to that off the Roumelian coast, but a bank of sand and shells extends to about 7 miles in a N.N.E. direction, having to the eastward mud and shells, and to the westward mud only, a sufficient indication in itself of the true entrance to the Bosphorus, as in no other place in the vicinity will the lead bring up sand and shells in a depth of from 36 to 40 fathoms.

In thick and foggy weather, if the light vessel cannot be sighted, or the fog guns heard, a vessel approaching from the northward should endeavour to ascertain her position by sounding, when a cast of 50 to 55 fathoms, mud and shell, would be an indication that she was off the Anatolian coast; standing cautiously to the southward, if the water shoals rapidly to 45 fathoms with the same bottom, she might then steer to the westward till sand and shells were obtained, when she would be in the fairway of the entrance.

If on the other hand, mud alone is found at a depth of from 50 to 55 fathoms, the ship would be off the Roumelian coast, and might stand to the south-east till the water shoaled to about 45 fathoms, mud and shell, when she will have just passed to the eastward of the entrance, and can then proceed as before directed. If a cast of 37 to 40 fathoms, sand and shell, be first obtained, a course may be at once steered to the southward for the Bosphorus.

A safer course will be, after obtaining soundings, to steer direct for the light vessel, when having ascertained her position a direct course may be shaped for the Bosphorus; and, in the event of her not being seen, the soundings would sufficiently indicate when she had been passed; as on approaching from the westward the soundings gradually increase, the bottom when past the light ship changing from mud, to mud and shell if to the southward, and to no bottom with 150 fathoms if to the northward. On approaching from the eastward on the other hand, the soundings

gradually decrease, and when past the light ship the bottom changes from mud and shell, to mud alone.

Beacons.—Vessels approaching the Bosphorus from the eastward or westward, should keep between the 40 and 45 fathoms line of soundings till sand and shells are obtained, when they would be just off the entrance; but a prudent navigator in no case would shoal his water to less than 45 fathoms until the sight of one of the lighthouses or beacons, or other marks upon the land, afforded additional proof of his position; and it should be borne in mind that the white marks only exist upon the Anatolian coast, and the large sandy patches of red on the European side; that all the beacons of the Anatolian coast are coloured red, and surmounted by globes, whilst the Roumelian beacons are all painted in red and white horizontal bands, and are surmounted by cones; that the station of the lifeboat and rocket service to the eastward of the entrance are all painted white to seaward, while those to the westward are red with a horizontal white band; also that the only white lighthouses are those of the entrance, that of Kilia or Shilli being painted red, like the Anatolian beacon, and Kara-burnu in red and white bands, in a similar manner to the Roumelian beacons.

FALSE ENTRANCES.—The two localities that bear the strongest resemblance to the entrance of the Bosphorus, and which were sometimes taken for it, are Shilli bay on the eastern side, and the neighbourhood of lake Derkos to the westward of Kara-burnu on the other, but being so well marked by beacons as just described, mistakes are not now so likely to occur.

If off Shilli in thick or foggy weather, a cast of the lead, will settle the question, as off here a bank of shells extend to fully 5 miles from the shore, whereas at that distance from the true entrance sand mixed with shells would be obtained with a greater depth of water.

Also off lake Derkos the lead will at once dispel the illusion, as mud and shell or shell alone will be obtained, but no sand and shell.

WINDS.—During the summer months, from the beginning of April to November, the prevalent wind is from the north-east with a fine clear atmosphere; south-west winds prevail during the remainder of the year, and blow sometimes with great violence in the months of December and January; the north-east gales being more frequently experienced in the months of September, October, and November.

Currents.—The currents of the Black sea in this vicinity with the exception of the indraught to the Bosphorus, are variable, being influenced

by the prevailing wind, though as a rule they set to the eastward along the shore at the rate of from a half to one mile per hour. (*See page 2.*)

For the navigation of the Bosphorus the seaman is referred to the “Sailing directions for the Dardanelles, the sea of Marmara, and the Bosphorus,” published by the Admiralty.



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